

IN INDUSTRY • IN TRANSPORTATION • ON THE SEA • IN THE AIR

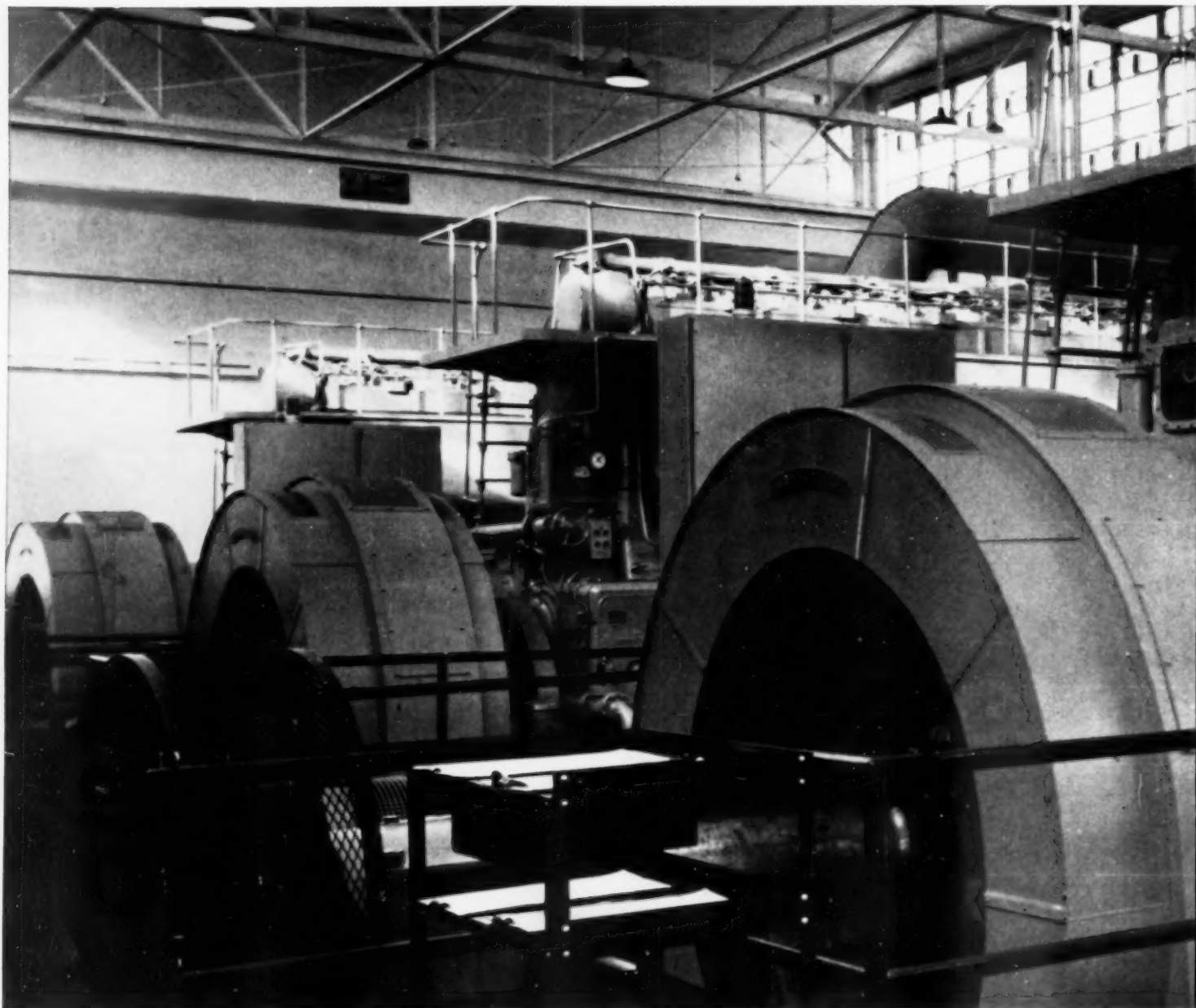
# **DIESEL** *and* **GAS TURBINE PROGRESS**



FIVE DOLLARS PER YEAR

MAY 1958

FIFTY CENTS PER COPY



## 4 reasons why cost-specify TEXACO

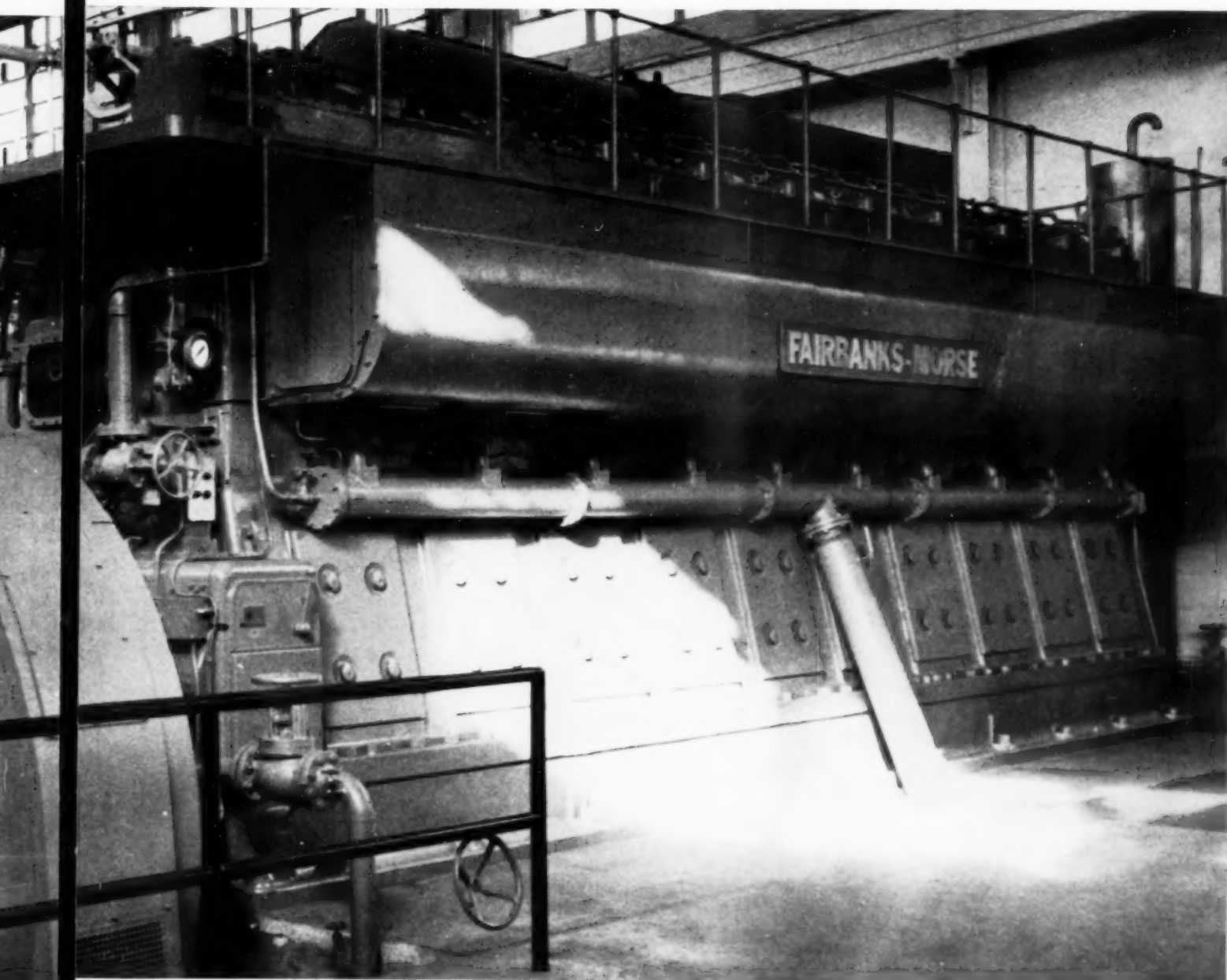
Increasing the output of the individual engine is one way to hold the line on rising operating costs. And effective lubrication can play a major role in increasing diesel efficiency. That's why more engineers are specifying Texaco Ursa Oil Heavy Duty for optimum diesel operation. Here are the reasons:

- **Keeps engines clean.** Texaco Ursa Oil Heavy Duty is fully detergent and dispersive, resists oxidation.
- **Keeps rings free** for full compression and complete combustion.

- **Increases parts life.** Bearings, pistons, liners all last longer with Texaco Ursa Oil Heavy Duty.

- **Reduces cost of maintenance,** minimizes fuel consumption.

Carefully refined and fortified with effective additives, Texaco Ursa Oil Heavy Duty assures more power with less fuel over longer periods between overhauls. That's why, *for over twenty years, more stationary diesel horsepower in the U.S. has been lubricated with Texaco than any other brand.*



## conscious engineers Ursa Oil Heavy Duty

A Texaco Lubrication Engineer will gladly give you full details on the lubrication needs of all diesel, gas and dual-fuel engines. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

☆ ☆ ☆

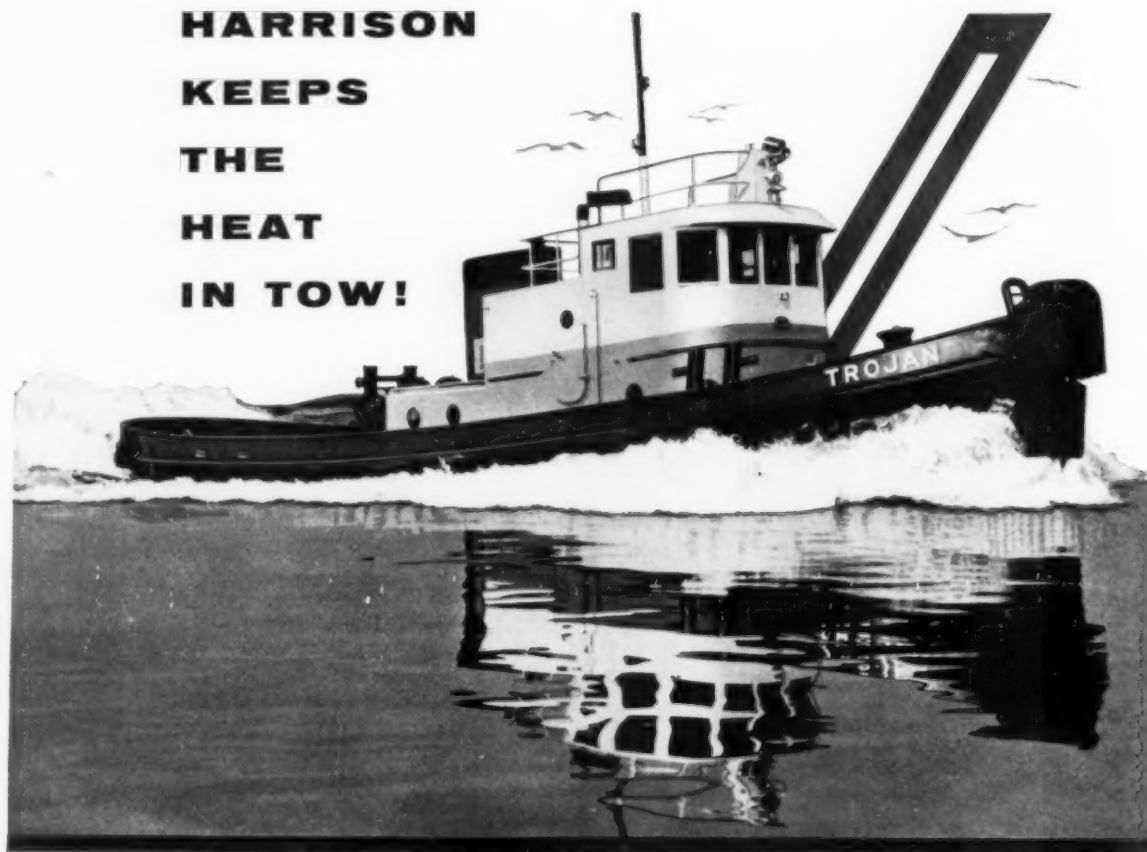
The Texas Company, 135 East 42nd Street,  
New York 17, N. Y.



**LUBRICATION IS A MAJOR FACTOR IN COST CONTROL**

(PARTS. INVENTORY. PRODUCTION. DOWNTIME. MAINTENANCE)

**HARRISON  
KEEPS  
THE  
HEAT  
IN TOW!**



Temperatures made to order for all types of diesel engines. Harrison heat exchangers are rugged, reliable and compact... engineered to provide the optimum in cooling efficiency.



**Harrison Heat Exchangers Help Keep This  
Tug on Round-The-Clock Duty for 3,456 Hours!**

Harrison gives heat the slip on any ship. This tug worked a 24-hour day for months with no breakdown—with Harrison heavy-duty heat exchangers on the job. Harrison heat-control equipment provides cool performance on many of today's top marine diesels... assures top efficiency, endurance and economy even under heavy loads. That's because Harrison is backed with over 47 years' research and manufacturing experience which assures you of complete dependability in a top-quality product. If you have a cooling problem, look to Harrison for the answer.



HARRISON RADIATOR DIVISION • GENERAL MOTORS CORPORATION • LOCKPORT, N.Y.

# DIESEL *and* GAS TURBINE PROGRESS

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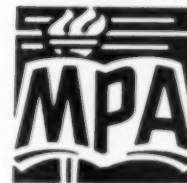


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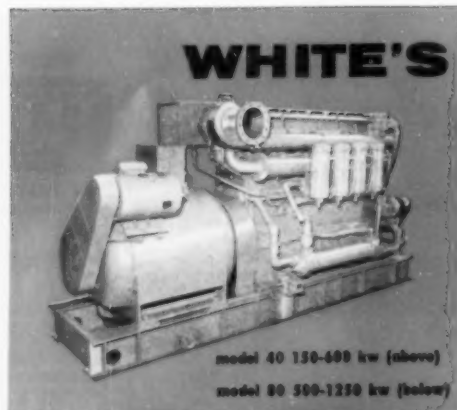
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## FRONT COVER ILLUSTRATION

The 80 ft *Rumak III* is powered with a pair of model 6-110 GM diesels and was designed and built by Trumpy & Sons of Annapolis, Md. for Mr. & Mrs. Wm. M. McKelvy of Pittsburgh. This fine yacht will headquarter at the Flamingo Dock, Miami Beach. Photo by Morris Rosenfeld, N.Y.



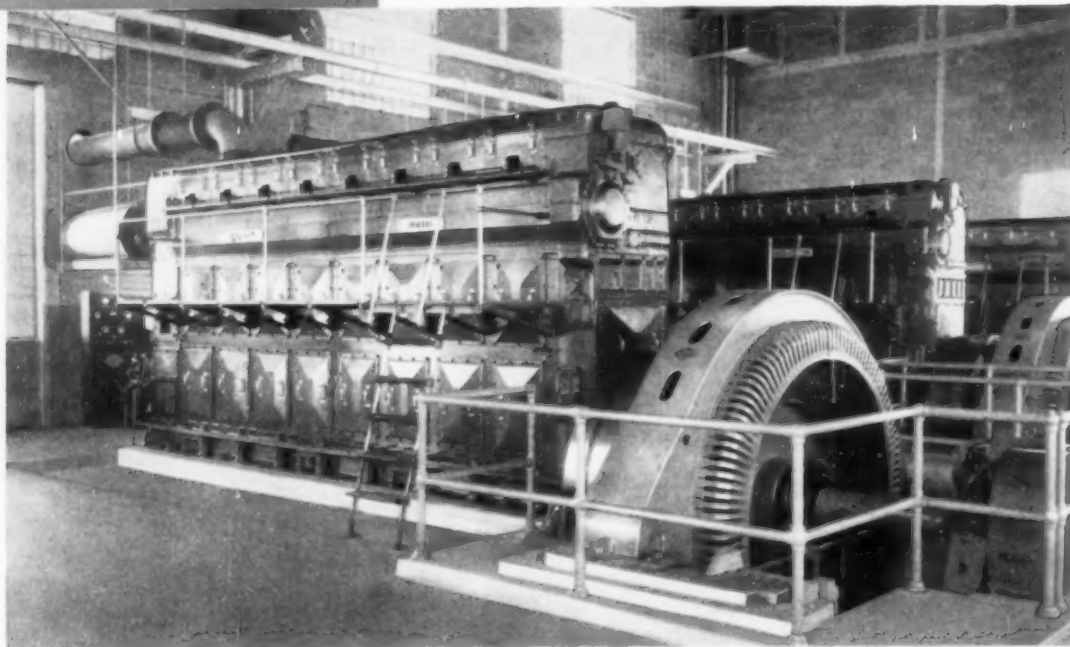
model 40 150-600 kw (above)  
model 80 500-1250 kw (below)

## WHITE'S Superior Engines...

give you all the proven  
benefits of simple design



*Easy Operation  
Efficiency  
Economy  
Dependability  
Long Life*



Extreme design simplicity distinguishes White's Superior engines. Relatively few cylinders and internal parts provide power equal to other engines having more cylinders and more complex construction. Such simplicity gives you many benefits. Superiors are *easier to start and operate*. The open chamber design achieves *efficient combustion* under all speeds and loads, giving *economical operation on non-premium fuels*. Fewer moving parts mean *fewer replacements and longer life*. Cylinder block design allows easy accessibility to internal parts for quick inspection and servicing. Hundreds of satisfied customers throughout the world repeatedly specify Superior Diesels for prime power, supplementary or standby power. Superior's simplified design proves its worth daily on municipal, public utility, construction,

marine, oil field, and general industrial applications. Diesel, dual-fuel, and gas engines are available in the range from 225 to 2150 H.P.; portable or stationary generator sets from 150 to 1500 KW.

### TYPICAL INSTALLATIONS

WOODSFIELD, OHIO: 1250 KW Model 80 dual fuel engine generator set.

ALBUQUERQUE, N. MEXICO: 250 KW Model 6G-825 gas engine generator set.

GRAETTINGER, IOWA: 500 KW Model 60 diesel engine generator set.

MILFORD, IOWA: 645 KW Model 60 dual fuel engine generator set.

WRITE TODAY FOR COMPLETE INFORMATION...

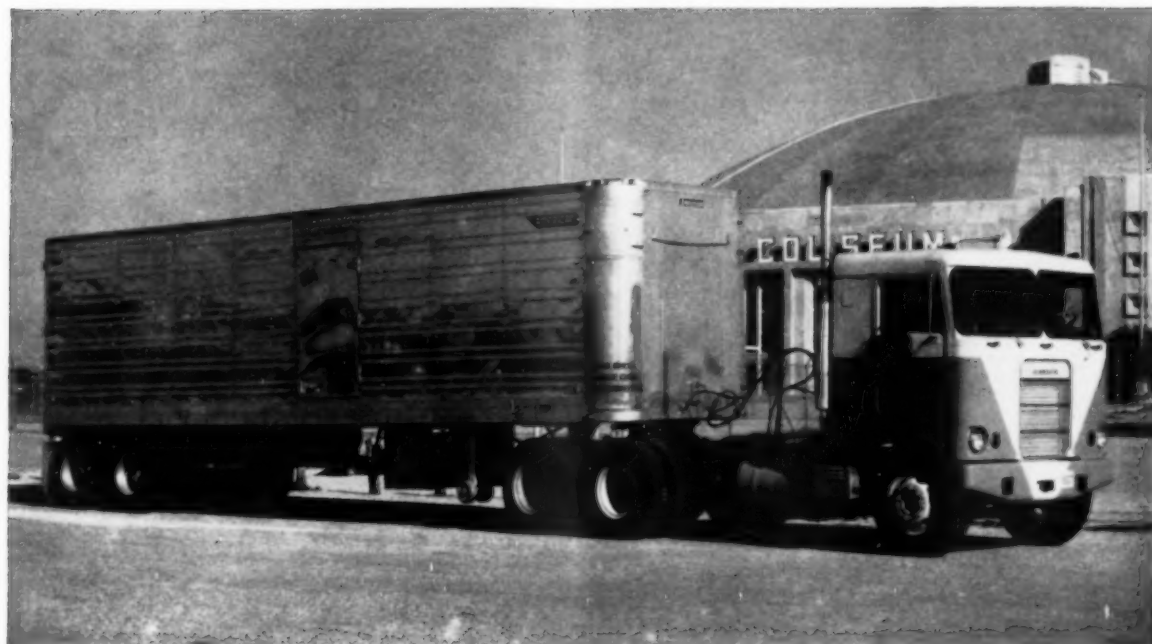


## White Diesel

### WHITE DIESEL ENGINE DIVISION

The White Motor Co. Plant and General Offices: Springfield, Ohio

SALES AND SERVICE POINTS: Ketchikan, Alaska; San Francisco, Terminal Island, Calif.; Denver, Col.; Washington, D.C.; Clearwater, Fla.; Chicago, Ill.; Wichita, Kan.; New Orleans, La.; Boston, Mass.; Baltimore, Md.; Park Rapids, Minn.; Webster Groves, Mo.; Callaway, Neb.; New York, N.Y.; Tulsa, Okla.; Portland, Astoria, Ore.; Hickory, Pa.; Ft. Worth, Houston, Texas; Seattle, Wash.; Calgary, Alberta; Vancouver, B.C.; Halifax, N.S.



*Geared by FULLER...*  
*Texas Dairy specifies R-96*  
**ROADRANGER® Transmissions**

When Milkhouse Cheese Corporation of San Antonio, Texas, purchased new Kenworth tractors recently, the firm specified Cab-Over-Engine Model 825's with Fuller R-96 ROADRANGER Transmissions.

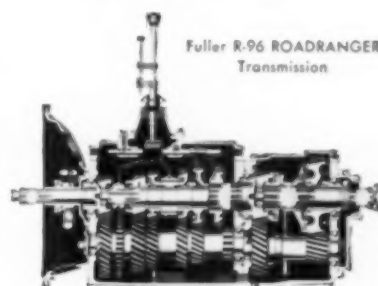
The all-aluminum 73-inch sleeper-cab tractors like the unit shown here, have a chassis weight of 12,790 pounds. Powered with 210 horsepower Cummins NHB diesel engines, these units have a payload capacity of 36,000 pounds.

Lou and Hyman Bernstein, president and vice-president of the firm, respectively, selected these custom-engineered Kenworths, with the 10-speed semi-automatic ROADRANGERS, for long hauls of frozen commodities from the Rio Grande country to the Midwest. These same tractor-trailer combinations haul the Bernsteins' own dairy products from Wisconsin for distribution in Texas.

Fuller ROADRANGER Transmissions give Milkhouse Cheese Corporation:

- Easier, quicker shifts—28% steps between ratios
- One shift lever controls all 10 forward and 2 reverse speeds
- No gear splitting—10 selective gear ratios are evenly and progressively spaced
- Engines operate in peak hp range with greater fuel economy
- Less driver fatigue—½ less shifting
- Range shifts pre-selected—automatic and synchronized
- Compact space-and-weight-saving economies—the most compact 10-speed transmission available
- Transmission weight under the cab—permitting more cargo to be carried on the payload axles

Get full facts on Fuller ROADRANGER Transmissions from your truck manufacturer or truck dealer now!



FULLER MANUFACTURING CO. Transmission Division • Kalamazoo, Mich.  
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**FAMOUS LAST WORDS:**

“they wouldn’t dare”

That’s what they said the day before Pearl Harbor. Remember? But by now you’d think people would have learned. Let’s face it—we must be ready for disaster at any moment. It may be an atom bomb—or it may be a fire, a flood, a hurricane. It’s only common sense to be prepared for it, whatever it is. Take these precautions **TODAY**:

- ☐ **Enlist the help** of your local Civil Defense Director.
- ☐ **Check contents** and locations of first-aid kits.
- ☐ **Send staff** to Red Cross courses. They may save your life.
- ☐ **Promote preparedness** in your community. Your local CD Director can show you how.

*Set the standard of preparedness in your plant city—check off these four simple points **NOW**.*

SPACE FOR THIS

**CIVIL DEFENSE**

MESSAGE CONTRIBUTED BY

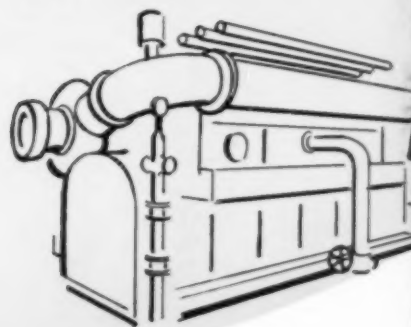


*Rev. J. J. Adams*



From Diesel Driven Compressors  
To Pipeline Pumping Stations...

**WOODWARD**  
**PG-PL GOVERNORS**  
**CONTROL THE**  
**PRIME MOVERS**

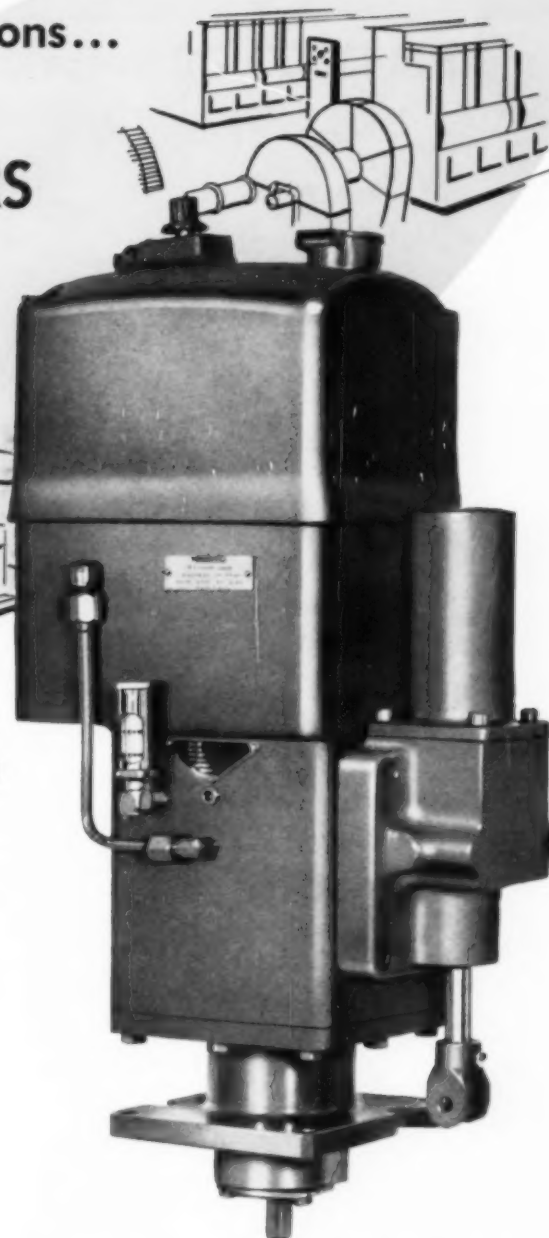


PG-PL Has Accuracy of Air Speed Setting  
to .03% Or Better!

The dependable accuracy of Woodward PG-PL Governors is known and proven around the world on many different prime movers.

Originally used on pipelines, the use of the PG-PL is now much more general. It extends through marine engine, sugar mill, turbine and other special applications. The PG-PL is superior in most ways to other methods of speed setting where automatic control of speed setting is desired.

The PG-PL offers ultra-precise automatic speed setting which responds to extremely small changes in control-air pressure. Its accuracy of air speed setting is .03% or better, responding to .001 p.s.i. change in control air pressure in the usual 3 to 15 p.s.i. range.



WRITE FOR DETAILS ON OUR UNIT EXCHANGE PLAN

Give serial number of typical governor  
when requesting any information.



**WOODWARD GOVERNOR COMPANY**

ROCKFORD, ILLINOIS

Fort Collins, Colorado

Schiphol, The Netherlands

**WORLD'S OLDEST AND LARGEST MANUFACTURER OF HYDRAULIC GOVERNORS EXCLUSIVELY**

## ENGINEER'S FIELD REPORT

PRODUCT RPM DELO OIL  
EDWARD KEEBLE CONSTRUCTION CO.  
FIRM San Jose, California

### RPM DELO Oil keeps tractor on the job 15 years



**Still Working** after 15 years using RPM DELO Oil in this D-8 Caterpillar operated by Edward Keeble Construction Co. Block, crankshaft, and most other parts of original engine are still in use. Another of firm's D-8's using RPM DELO Oil ran 12,000 hours without engine repairs. When torn down, maximum crankshaft wear was .004".



**Crawler Crane**, like firm's other heavy-duty equipment, uses RPM DELO Oil. Keeble operates 120 pieces of construction equipment—has as many as 30 jobs going at once.



**GMC V-8 10-Yard Dump Truck** (left), one of a new fleet of 12, also uses RPM DELO Oil. Mr. Keeble (right), says, "For the past 15 years we have kept our heavy-duty engines in top operating condition with RPM DELO Oil. In several instances engines have actually outlasted equipment."



TRADEMARK "RPM DELO" AND DESIGN REG. U. S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20  
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey

#### Why RPM DELO Oils reduce wear—prolong engine life

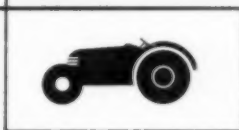
- Oil stays on engine parts - hot or cold, running or idle
- Anti-oxidant resists lacquer formation
- Detergent keeps parts clean
- Special compounds prevent corrosion of bearing metals
- Inhibitor resists crankcase foaming



**For More Information** or field help with any fuel or lubrication problem, contact representative of any company listed, or write direct.

STANDARD OIL COMPANY OF TEXAS, El Paso  
THE CALIFORNIA COMPANY, Denver 1, Colorado

## THE PROOF RUNS INTO THE MILLIONS



Proof of injection pump performance cannot be established by the record of one or a hundred or a thousand engines. Every manufacturer knows this.

Robert Bosch Fuel Injection Equipment has been proven on millions of engines! This record of dependability stands alone in the industry.

The experience it represents is at your service now.

### ROBERT BOSCH CORPORATION

40-25 Crescent St., Long Island City 1, N. Y. Branch: 225 Seventh St., San Francisco 3, Cal.

\*Registered U. S. Pat. Office, Robert Bosch G.M.B.H., Manufacturers of Robert Bosch Products

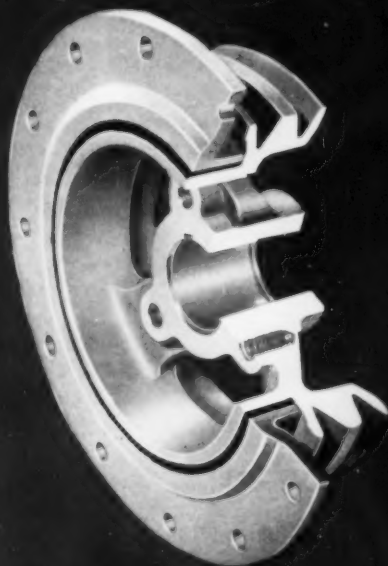
#### First in Gasoline Injection too!

Spectacular records in power, speed and economy have been achieved with Robert Bosch Gasoline Injection Equipment.

*Sells*

**SCHWITZER**

*New Approach*



Schwitzer makes available to you a complete Engineering Service for the efficient solution of your Vibration Isolation Problems including: Torsional Vibration Dampers, Rubber Mounted Fan Drives, Isolated Drive Couplings, Engines and other motor logs.

Years of background tested Schwitzer in developing the Non-Damned Healthy Torsional Vibration Dampers for the industry. This new approach by Schwitzer has led to developments that have answered many other Drive, Isolation and Isolation problems.

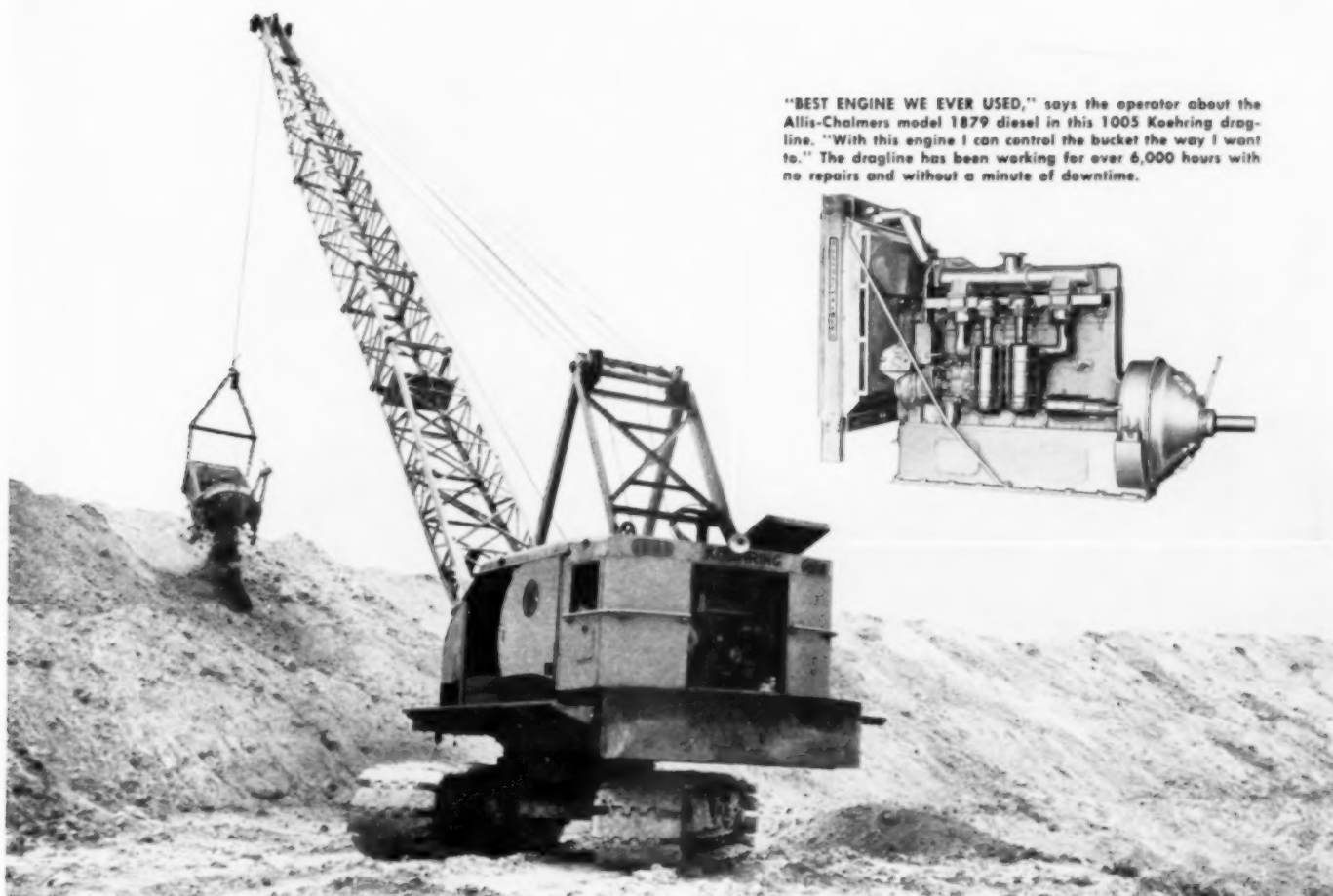
Many millions of Schwitzer Dampers on varied installations throughout the world have proven their many advantages, of lower cost, maximum dampening, with long dependable life.

**SCHWITZER**  
CORPORATION  
INDIANAPOLIS, INDIANA

FOR 40 YEARS

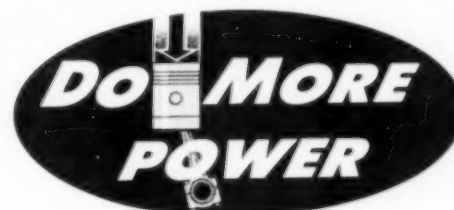
FAN DRIVES	OIL PUMPS
FAN BLADES	SHAFT SEALS
ACCESSORY DRIVES	WATER PUMPS
VIBRATION DAMPERS	TURBOCHARGERS
AIR STARTING MOTORS	SUPERCHARGERS

Call on SCHWITZER for a new cost-saving approach.



"BEST ENGINE WE EVER USED," says the operator about the Allis-Chalmers model 1879 diesel in this 1005 Koehring dragline. "With this engine I can control the bucket the way I want to." The dragline has been working for over 6,000 hours with no repairs and without a minute of downtime.

**Allis-Chalmers Engines give you**



**That's RIGHT for your needs**

**RIGHT PERFORMANCE** — Allis-Chalmers engines have *Do-More Power* — high torque, maximum work for each operating dollar.

**RIGHT TYPE AND SIZE** — There's a wide range of sizes and types, 9 to 516 hp — benefit from *Do-More Power* in all your equipment.

**RIGHT FUEL** — You can choose the fuel that's most practical — diesel, LP or natural gas or gasoline.

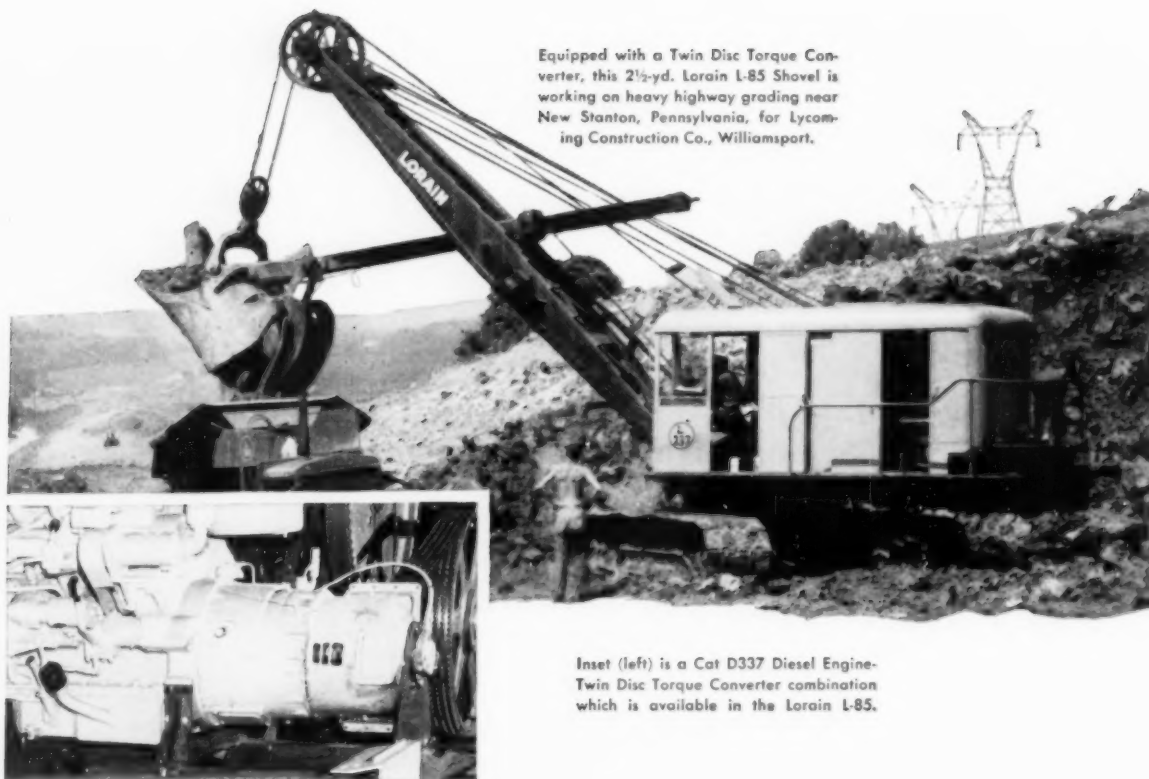
**RIGHT SERVICE BACKING** — wherever you are. Your Allis-Chalmers engine dealer has stocks of parts, backed by nearby company branch stocks. He also has factory-trained servicemen — complete facilities to give you prompt service.

See your Allis-Chalmers dealer for full details on *Do-More Power* engines that are right in every way for your job. Allis-Chalmers, Engine-Material Handling Division, Milwaukee 1, Wisconsin.

**ALLIS-CHALMERS**



BC-11



Equipped with a Twin Disc Torque Converter, this 2½-yd. Lorain L-85 Shovel is working on heavy highway grading near New Stanton, Pennsylvania, for Lycoming Construction Co., Williamsport.

Inset (left) is a Cat D337 Diesel Engine-Twin Disc Torque Converter combination which is available in the Lorain L-85.

## How torque converters assure higher dividends from your major equipment investments

Twin Disc Torque Converters, dependably and efficiently transmitting power to your heavy-duty machinery, assure you a higher return on your equipment investment, through more work done in less time . . . with a minimum of maintenance and costly downtime.

Here are five profitable, proved reasons why Twin Disc Torque Converters help you to earn more from your other equipment investments . . . such as the Lorain L-85 Shovel pictured above.

1. The torque converter eliminates lugging and stalling . . . permitting engines to work in the maximum efficiency range all the time, delivering constant high-horsepower output—getting more work done.

2. Experience has proved that smooth converter power reduces peak

loads throughout the shovel drive train because fluid within the converter absorbs much of the impact energy resulting from a quick drum speed change . . . thus protecting both driving and driven equipment.

3. When necessary, the torque converter smoothly delivers approximately twice normal torque to the drum, which, at slow digging speed, represents an important advantage in power delivered to the dipper.

4. Cable life is extended since no sharp impact loads ever reach cables through the torque converter. Constant line tension is maintained . . . there is no jerking or snapping.

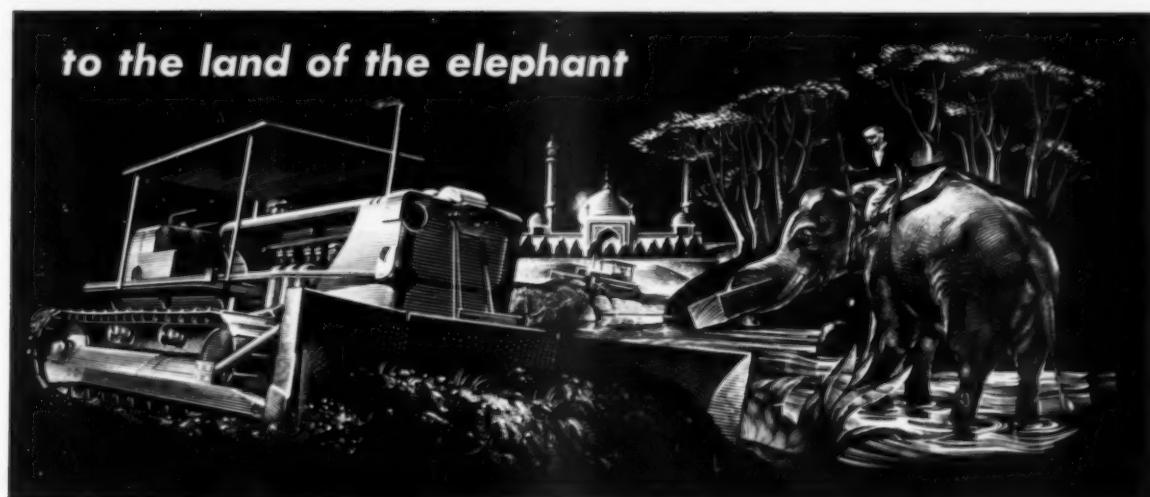
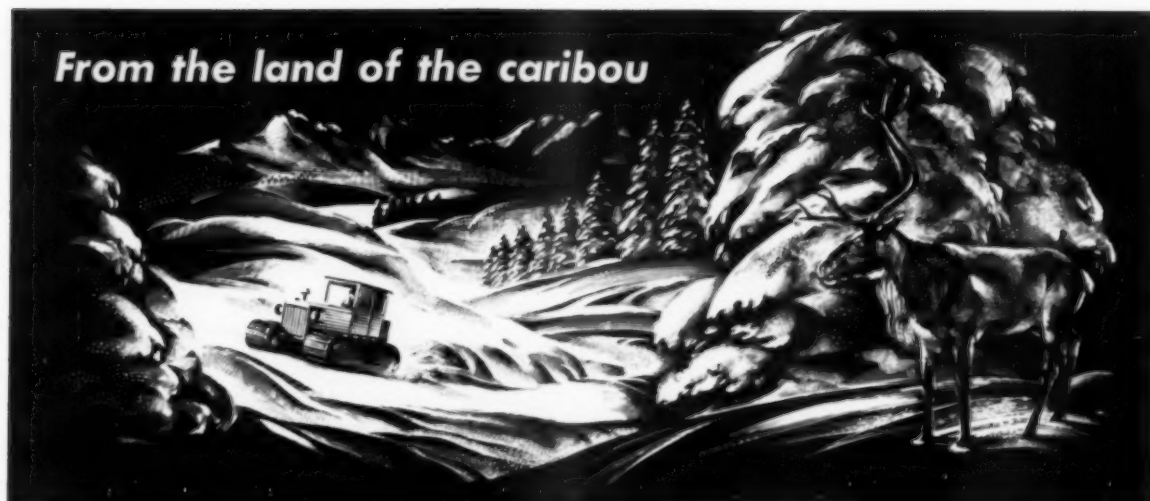
5. An infinite variety of ratios is available to work with, permitting smooth, accurate control of loads and delicate "inching" or "holding" under power.

Specify a torque converter in your next new machine, or when you re-power. And investigate the advantages of Twin Disc Torque Converters—both single-stage and three-stage—for most other heavy-duty applications from 30 to 1000 hp.

For details, request Bulletin 508 and 135-E (single-stage and three-stage respectively.)



**TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division), Rockford, Illinois**



**Its performance and name  
are the same around the world**

**Other Outstanding  
Shell Industrial Lubricants**

- Shell Tellus Oils**—for closed hydraulic systems
- Shell Talona R Oil 40**—anti-wear crank-case oil for diesel locomotives
- Shell Alvania Grease**—multi-purpose industrial grease
- Shell Turbo Oils**—for utility, industrial and marine turbines
- Shell Dromus Oils**—soluble cutting oils for high-production metal working
- Shell Macoma Oils**—for extreme pressure industrial gear lubrication
- Shell Voluta Oils**—for high-speed quenching with maximum stability

Shell Rimula Oil is a heavy-duty oil designed to solve the toughest lubricating problems in diesel engines.

One of these problems—excessive cylinder and ring wear—results from acidic combustion products. It occurs under all operating conditions, but is especially severe under low jacket temperatures. Rimula® Oil contains an alkaline additive that counteracts this acid wear. It remains stable under the widest temperature extremes en-

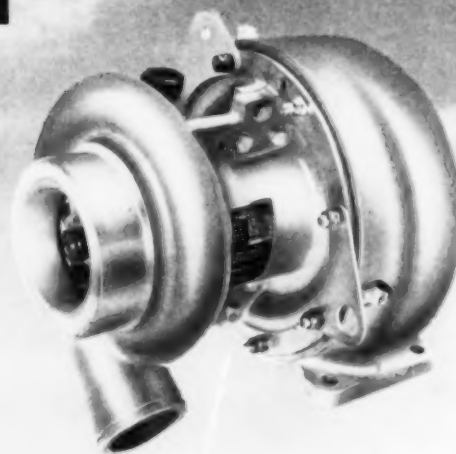
countered in modern operation. It keeps engine parts clean and operating efficiently over longer periods . . . effecting worthwhile savings in labor and parts.

Rimula Oil is available to your customers abroad. They can depend upon it for the most severe conditions of diesel operation. For full information, write: Shell Oil Company, 50 West 50th Street, New York 20, New York, or 100 Bush Street, San Francisco 6, California.

**SHELL RIMULA OIL**



# **NOW! AIRESEARCH TURBOCHARGERS ON INTERNATIONAL HARVESTER TD-24**



## *Boost giant crawlers over rugged terrain at high altitudes*

**Uniform sea level performance** in the thin air of Colorado's high country is standard operating procedure for International Harvester's big TD-24 crawlers, now that the AiResearch Turbocharger T-14 has been added.

Actual on-the-job results at high altitudes under widely varying

operating conditions have shown:

- increased horsepower to sea-level rating
- lower fuel consumption per horsepower
- improved lugging
- less smoking and cleaner running engine
- reduced maintenance costs

All AiResearch turbochargers are air-cooled, thereby requiring no extra plumbing, and placing no added burden on the cooling system. Ease of installation and long life add to the outstanding record of AiResearch turbochargers in the field.

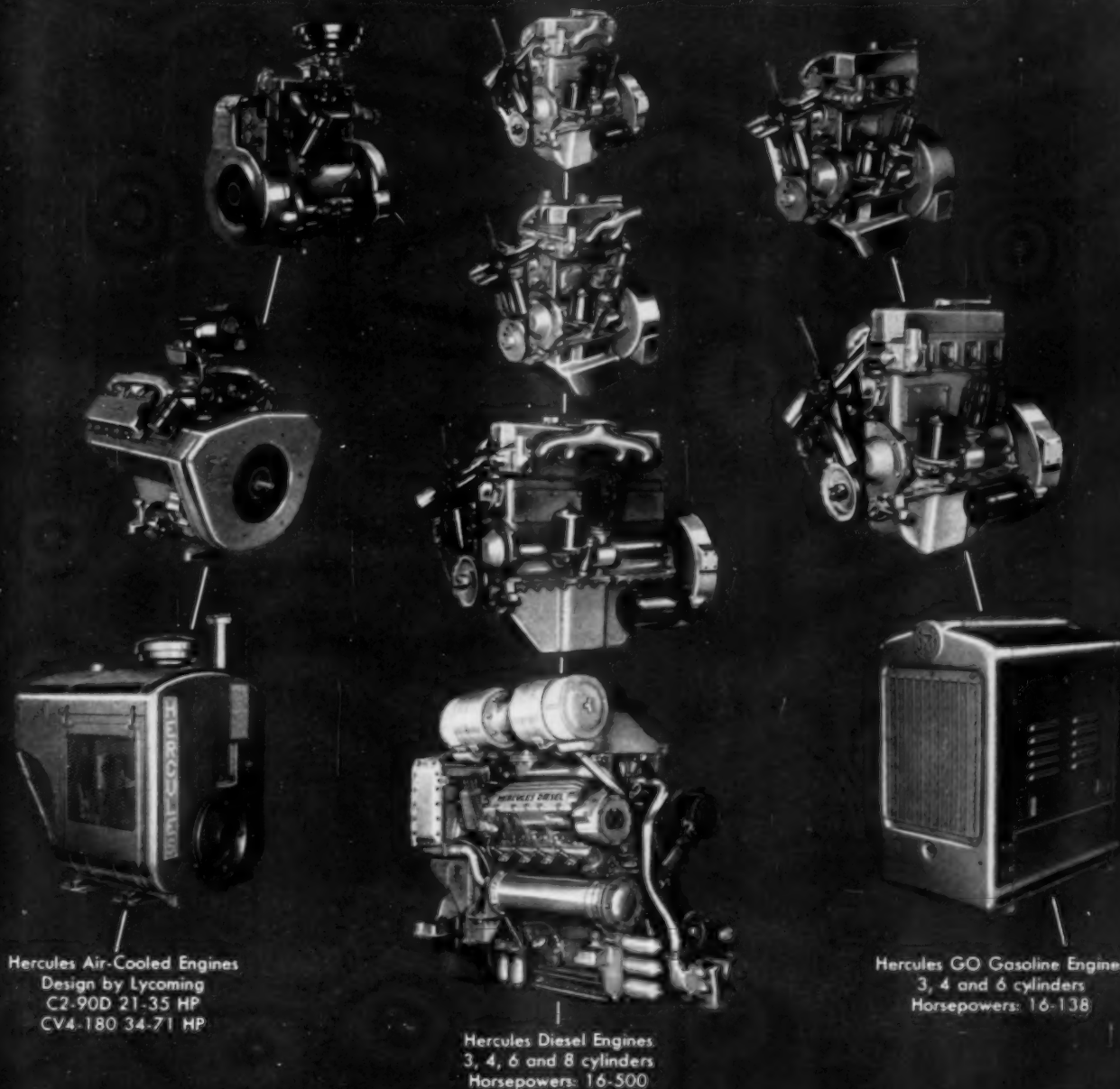
Your inquiries are invited.



**AiResearch Industrial Division**  
9225 South Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND SPECIALIZED INDUSTRIAL PRODUCTS

# great new lines of engines and power units from **HERCULES**



**Hercules Air-Cooled Engines**  
Design by Lycoming  
C2-90D 21-35 HP  
CV4-180 34-71 HP

**Hercules Diesel Engines**  
3, 4, 6 and 8 cylinders  
Horsepowers: 16-500

**Hercules GO Gasoline Engines**  
3, 4 and 6 cylinders  
Horsepowers: 16-138

The modern Hercules lines of engines have advantages for everyone: to the equipment manufacturer, complete mounting interchangeability of DD and GO series engines in the same number of cylinders means that customers' engine preference can be met from 6 engines without design modification. To users of Hercules-powered equipment, an unusually high degree of parts interchangeability between all engines and rugged, dependable design reduce maintenance costs to a minimum. And, these new engines are backed by Hercules 43-year reputation for engine building know-how.

The Hercules industrial air-cooled engines, designed by Lycoming, offer a unique combination of high HP pound, accessibility, fuel economy and parts interchangeability. The design of these engines incorporates

the dependability and endurance for which the Lycoming name is justly famous in aircraft engines.

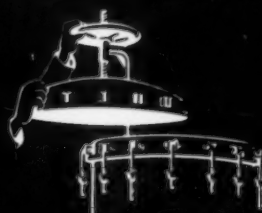
Other Hercules engines are available in from 4 to 500 horsepower. For full details and descriptive literature, write Hercules Motors Corp., Dept. 13E, Canton 2, Ohio. Or write the Hercules distributor-dealer near you in the world-wide Hercules sales and service network.



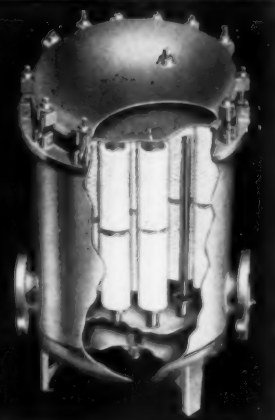
HERCULES MOTORS CORPORATION  
Canton, Ohio



## SAVE TWO WAYS WITH **NEW** HI-CAPACITY *Fulflo Filter*



Model WH Hi-Capacity Fulflo Filter with optional Cover-Lifting Device and Pressure Gauges. Note compactness and simplicity of inner assembly.



The completely new Hi-Capacity Fulflo Filter for diesel fluids brings you substantial savings through positive engine protection — plus *lower-than-ever initial cost*.

This compact sturdy steel filter is available in a full range of sizes — with from 24 to 270 10-inch Honeycomb Filter Tubes. Brand new cover is fastened by sturdy bolts which swing down when loosened to release cover for easy access to filter tubes. Optional Cover-Lifting Device enables cover to swivel aside for even speedier servicing.

The WH Fulflo Filter provides continu-

ous micro-clarity, at minimum pressure drop, for all types of lubricating oils; also bulk filtration of fuel oils.

Exclusive Honeycomb Filter Tubes provide true *depth* filtration through hundreds of filtering tunnels, precision engineered for uniformity of size, shape and depth. Tubes are available in a wide range of positively controlled densities and in a variety of natural and synthetic fibres.

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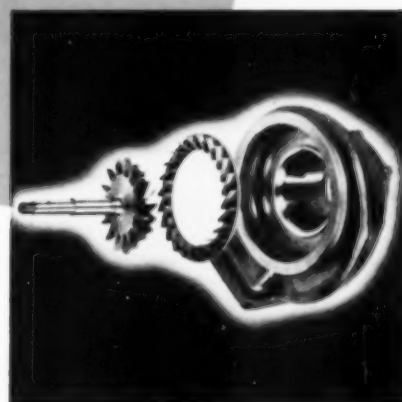
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**JET DIVISION**  
**Thompson Products, Inc.**

Cleveland 17, Ohio



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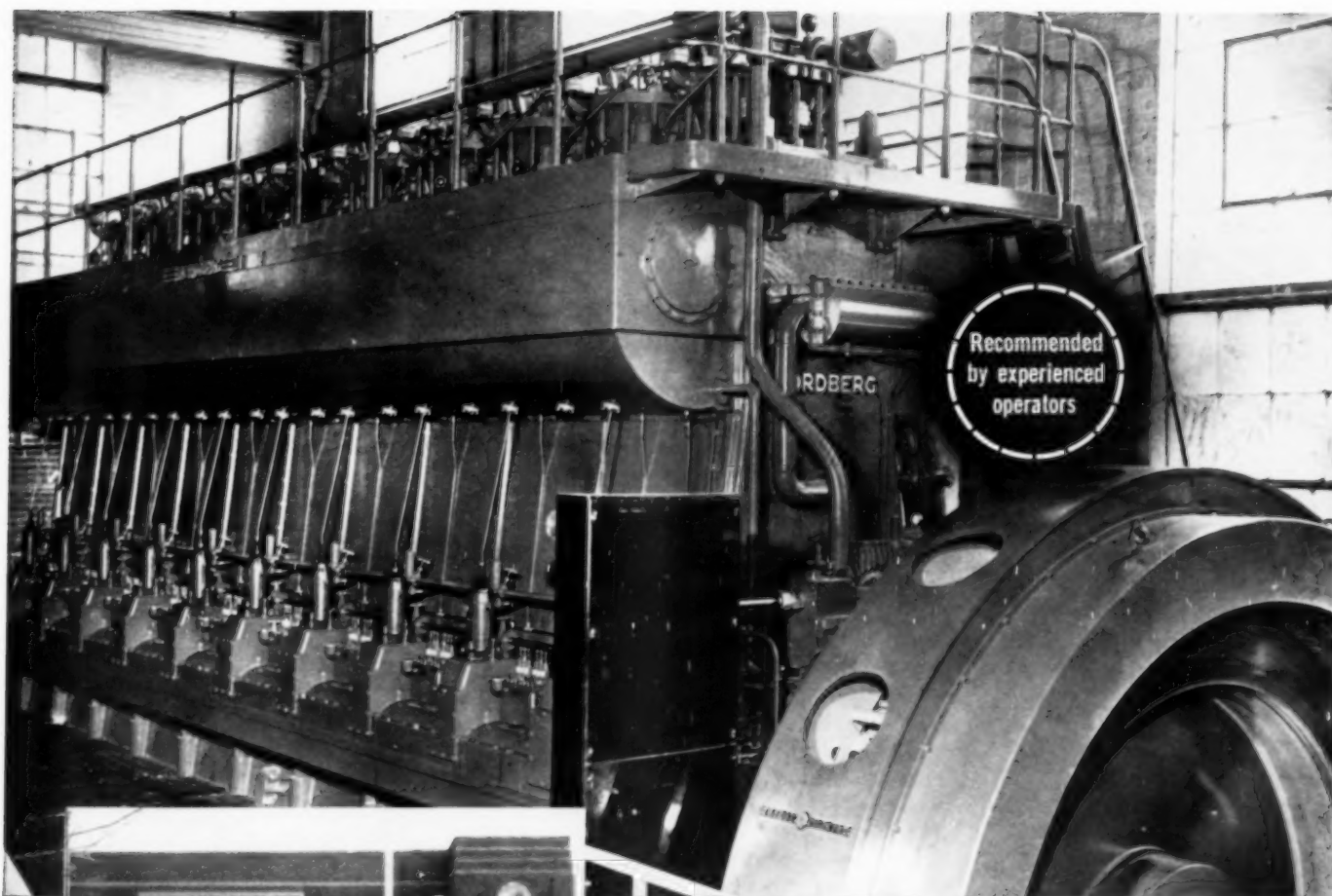


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*Steam Turbine Company*

TRENTON 2, NEW JERSEY





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And conditions at Hudson, Mass. are very similar to scores of municipal light and power plants in all parts of the country . . . where economical, reliable, around the clock power is needed to meet the ever-increasing electrical demands. That's why there are so many *repeat orders* for Nordberg Diesel, Duafuel®, and Spark-Ignition Gas engines, from experienced operators like Mr. Walsh. Next time, consult Nordberg on your power study . . . builders of America's largest line of heavy duty engines.

NORDBERG MFG. CO., Milwaukee, Wisconsin

*Installation Data:*

City of Hudson, Massachusetts

Two Nordberg 2-cycle engines of 21½" bore installed, totaling 9350 bhp:

- First engine, a 10-cylinder Nordberg Diesel unit, rated 4250 bhp.
- Second engine, a 10-cylinder Nordberg Duafuel® unit, rated 5100 bhp.

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P857





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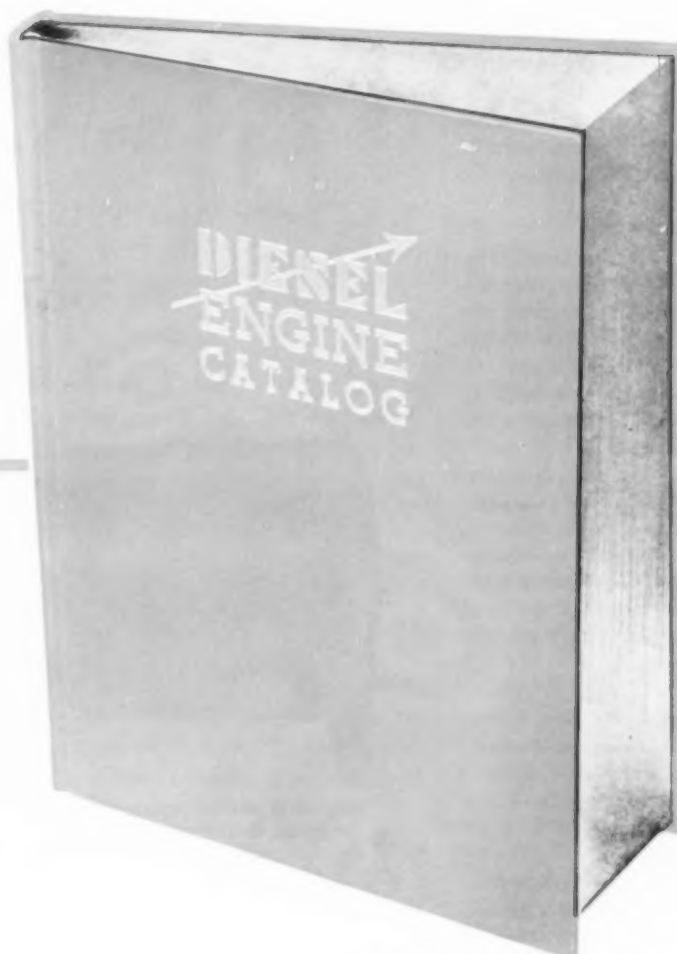
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## Gulf Coast Diesel

### Notes

By Michael T. Pate

ANDERSON, Clayton & Company, Houston, Texas, has purchased through Waukesha Sales & Service, Inc., Houston, two model 6-LRDBCSU Waukesha diesels, each rated 660 hp at 1200 rpm. The diesels, equipped with AiResearch turbochargers, are destined for service in cotton gins, one in Navajoa, Sonora, Mexico; the other in Los Mochis, Sinaloa, Mexico.

MC CLELLAND Engineers, Houston, Texas, have bought from Applied Power Equipment & Manufacturing Company, Houston, a model DA-153 Allis-Chalmers diesel, rated 33 hp. The 4-cylinder diesel will power a portable geophysical rig used for drilling shot holes.

GABLE Electric Company, Dallas, Texas, is installing a 75 kw emergency generator set at Braniff International Airway's main base at Love Field, Dallas. The set is powered by a model 148-DKU Waukesha diesel furnished by Waukesha Sales & Service, Houston, Texas.

CONTINENTAL Emisco Company, Houston, Texas, has bought from Applied Power Equipment & Manufacturing Company, Houston, a model BD-77 Allis-Chalmers 2-cylinder 15 hp diesel which will be used to drive a Gardner-Denver air compressor.

H. BROWN Supply Company, Eunice, Louisiana, has secured from Waukesha Sales & Service, Inc., of Houston, a model 6-WAKDU Waukesha diesel, rated 190 hp at 1300 rpm.

MC COLLUM Exploration Company, Houston, Texas, is powering a generating set with a model BD-77 Allis-Chalmers 2-cylinder, 15 hp diesel. The unit was sold by Applied Power Equipment & Manufacturing Company, Houston.

GARDNER-Denver Company, Dallas, Texas, has taken delivery from Waukesha Sales & Service, Inc., Houston, of three model 6-NKDBU Waukesha diesels, rated 258 hp each at 1100 rpm. The diesels will be used to power G-D air compressors.

HERCULES Powder Company, Hattiesburg, Mississippi, will repower a G-E locomotive with a 290 hp model NHS-6-BI Cummins diesel delivered by the Cummins Sales & Service, Inc., Fort Worth, Texas.

LAZZEARD Brothers, New Iberia, Lou-

isiana, is equipping a drilling barge with a model VT-12 Cummins diesel, rated at 600 hp, which will drive through a Clark torque converter. The diesel was sold by Cummins Sales & Service, Inc., Fort Worth, Texas.

SOUTHWEST Industrial Electronics Company, Houston, has secured from Stewart & Stevenson Services, Inc., Hous-

ton, a series 71, model 4030-C, 4-cylinder diesel equipped with Allison torqmatic transmission. The diesel is rated 80 hp.

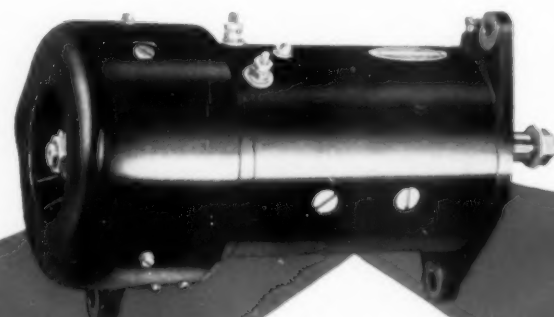
E. L. LESTER Company, Houston, Texas, will power a model 70-B American hoist with a 65 hp General Motors diesel, series 71, model 3030-C. The 3-cylinder, open type diesel is equipped with an Allison torqmatic transmission, and

was furnished by Stewart & Stevenson Services, Inc., Houston, Texas.

BROWN & Root, Inc., Houston, Texas, has bought from Stewart & Stevenson Services, Inc., Houston, two General Motors series 71, 4-cylinder, model 4031-C closed diesel units.

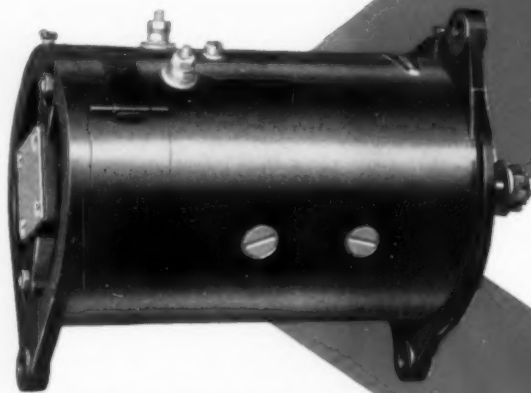
GULF Oil Corporation, Pittsburgh,

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- Ball bearings at both drive and commutator ends
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- Hot-impregnated armature for extra insulation
- Dynamically balanced armature
- Wider, heavier brushes—service up to 100,000 miles is common

Pennsylvania, has taken delivery from Stewart & Stevenson Services, Inc., Houston, Texas, of three General Motors series 71, twin-6, model 12107 torque-converter equipped industrial diesel units.

C. J. SIMPSON, Dallas, Texas, is using a model JT-6-B Cummins diesel, rated 175 hp, to repower an International L-

190 truck. The diesel was sold by Cummins Sales & Service, Inc., Fort Worth, Texas.

JACKSON Machinery Company, New Orleans, Louisiana, has secured from Cummins Sales & Service, Inc., Fort Worth, Texas, three model NRT0-6-M Cummins diesels, rated 335 hp each. The diesels will be used to power crewboats

for marine oil operations.

LAKE CHARLES Dredging Company, Lake Charles, Louisiana, has bought a Stewart & Stevenson model 110GD-500C 500 kw ac generating set, driven by a General Motors quad model S24-2406 diesel.

S. T. YATES Drilling Company, Artesia,

New Mexico, has secured from Stewart & Stevenson Services, Inc., Houston, a twin-six series 110, model 122406 General Motors industrial diesel unit, rated at 400 hp.

W. T. REESE, Corpus Christi, Texas, has obtained from Stewart & Stevenson Services, Inc., Houston, a General Motors series 110, 6-cylinder model 62406 marine diesel, equipped with hydraulic reduction and reversing gear. The diesel is rated at 300 hp.

### Synchronous Generators Bulletin

New 10-insert loose-leaf bulletin No. SB-184 features 320, 400, 500 and 580 frame Synchronous Generators from 30 to 300 kw at 1800 rpm for use with diesel engines. All are compactly designed for minimum space requirements. Separate insert pages show generator and wall mounted control cabinets; connection diagrams for selecting voltages from 120 v to 480 v; generator and control interconnections; package control model chart; and insert of 340 service stations servicing Marathon motors and generators. Copy of Bulletin SB-184 can be had by writing Marathon Electric Mfg. Corp., Wausau, Wisconsin.

### Industrial Division Expanded

Fram Corporation, Providence, R. I., has announced the enlargement of its Industrial Division. Changes include the appointment of regional industrial sales managers and the formation of a separate sales force to sell the industrial line exclusively. The new setup was made necessary by increased sales of its industrial filters, according to William W. Eaton, Industrial Division Sales Manager. In the past, Fram has sold its industrial filters through its automotive salesmen. The Company is now adding a new group of sales representatives who will devote full time to sales of the industrial line.

Four regional industrial sales managers have been named: C. B. Gouert, Jr., 430 40th Street, Oakland 9, California, will direct West Coast sales from Seattle to San Diego. P. S. Innis, 724 Cecile Place, Shreveport, Louisiana, will direct Southwest sales from New Orleans through Oklahoma and Texas. C. N. Haskins, 1800 Marguerite Terrace, Park Ridge, Illinois, will direct Middle West sales in Illinois, Indiana and Ohio. J. S. Evans, 3B-4 Redfield Village, Metuchen, N. J., will direct Northeast sales in New England, New York, New Jersey and Pennsylvania. Complete information on Fram industrial or Fram domestic oil burner filters is available from Industrial Division, Fram Corporation, Providence 16, R. I.

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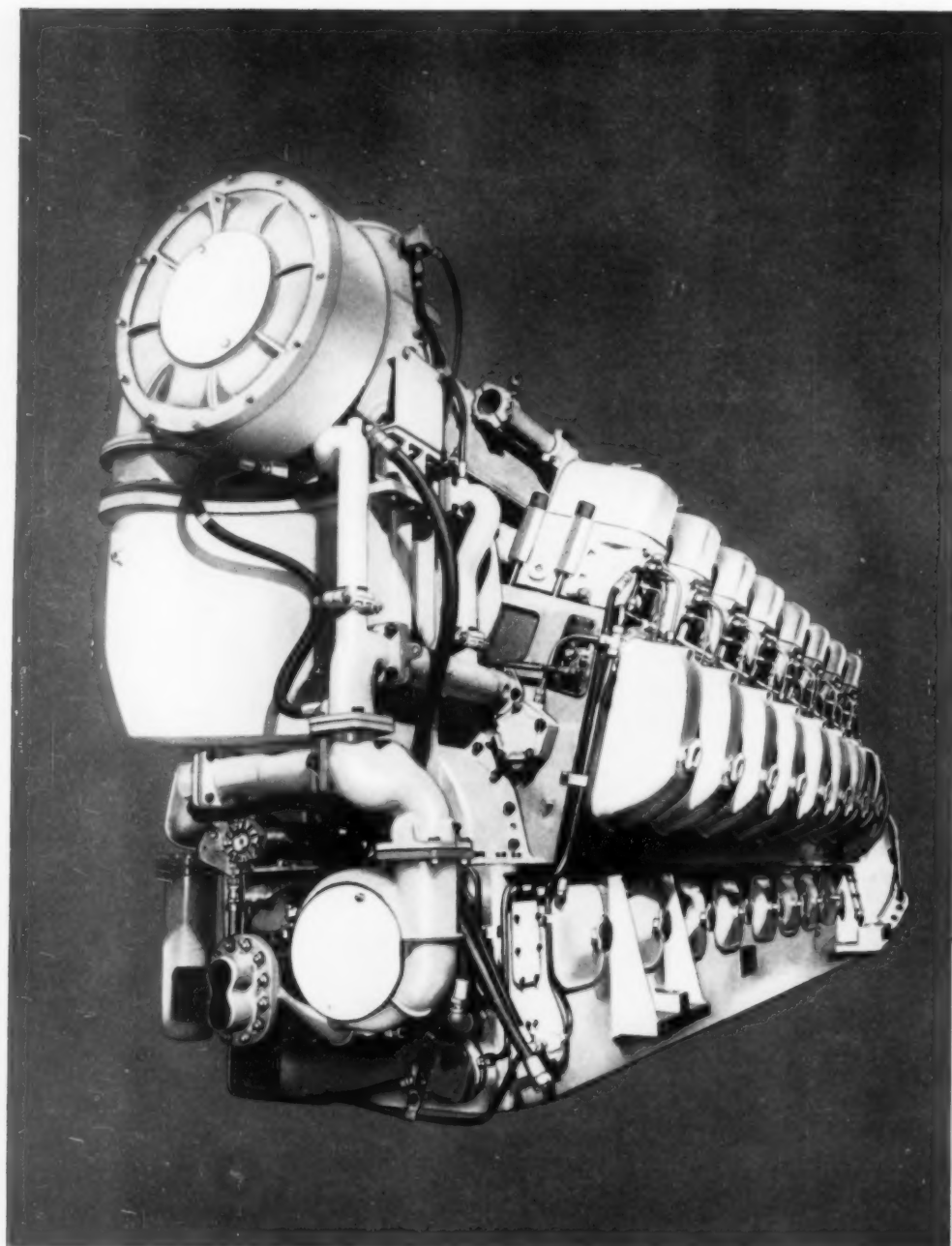
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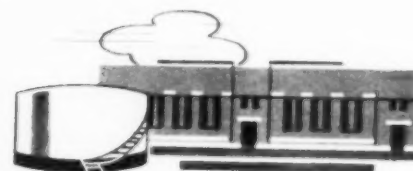
- Greater output at engine idle
- Dependable performance at all operating speeds
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- Exclusive stainless steel slip rings
- Extra-large ball bearings at both drive and commutator ends
- Shaft-keyed rotors prevent high torque slippage
- Easy all-around maintenance—positive oiler lubrication



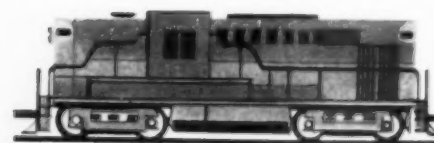
This 16-cylinder engine is the top of the 600-2400 hp range of ALCO heavy-duty, turbocharged diesels.



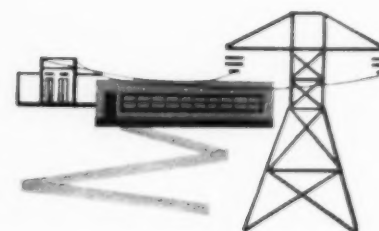
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DIESEL-ELECTRIC LOCOMOTIVES • DIESEL ENGINES • RENEWAL AND MODERNIZATION PARTS • REPAIR AND REBUILD SERVICES

# AGUA DULCE GAS ENGINES USE VAPOR PHASE COOLING

**United Gas Pipe Line Company Improves Efficiency of Five  
880 hp Engine-Compressor Units and Drives Cooling Fan with  
Turbine Receiving Steam Generated in Engine Jackets.**

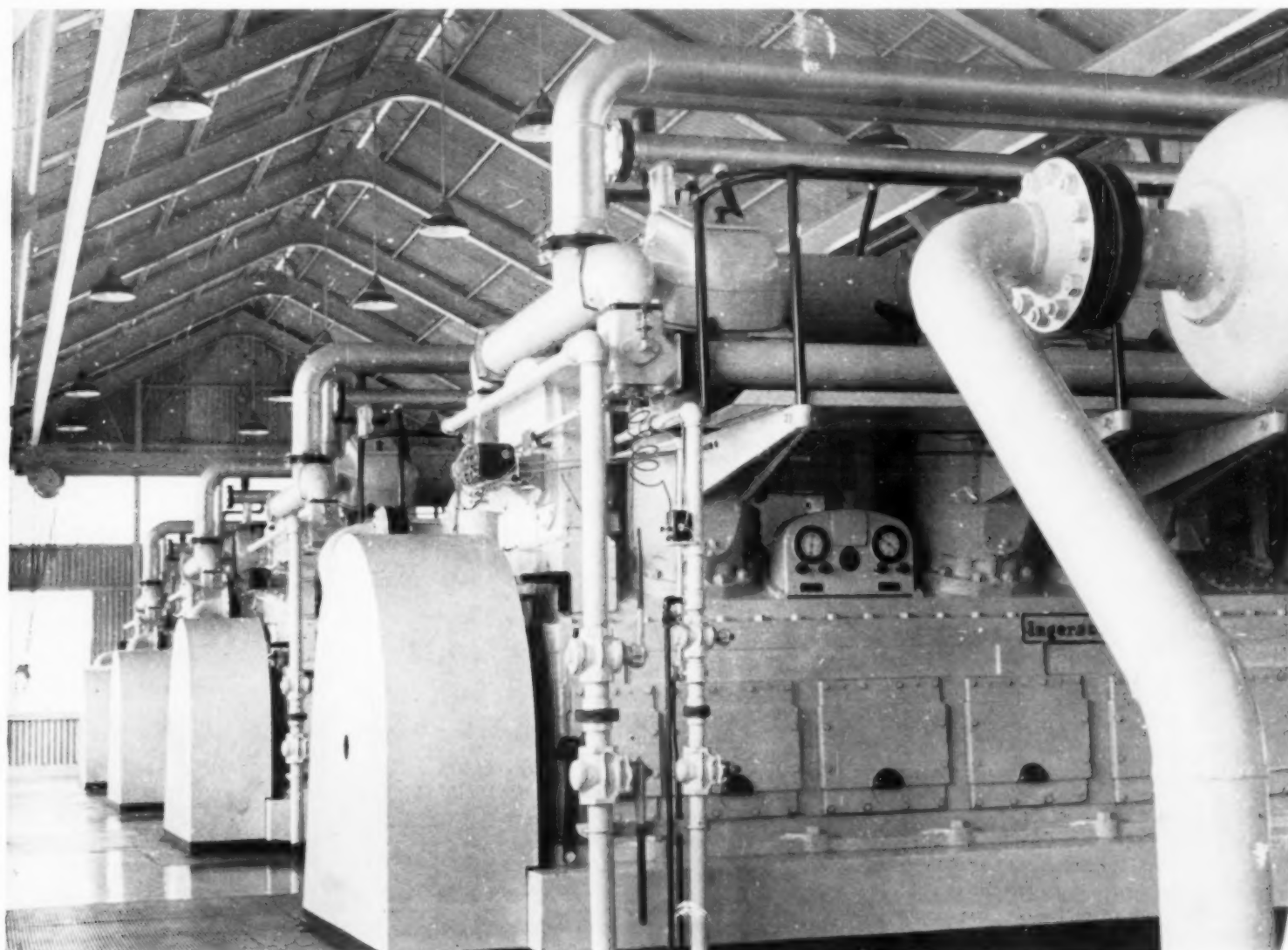
**A**T the Agua Dulce, Texas gas compressor station owned by the United Gas Pipe Line Company, five Ingersoll-Rand 880 hp engines driving 90° angle compressors are cooled by the Vapor Phase thermal circulation system. The steam generated from one of the units operates a turbine to drive the fan for steam condensing and oil cooling. As the result of satisfactory operation of the engines and a comprehensive study made by the Engineering Department of the company, three similar engines to be installed in the Cabeza Creek station will also employ Vapor Phase cooling. Steam turbine operation with some modifications resulting from experience gained with the first one will be used in this station also. The general arrange-

ment of the new installation is of particular interest and a diagram of it is illustrated here with. The reasons for installing Vapor Phase at Agua Dulce were to achieve a lower first cost as well as reduce operating costs on the engine cooling systems. It is hoped that operation of engines with Vapor Phase will over a long period of time indicate a reduced rate of cylinder and ring wear and better results of engine lubrication. Engines in the past have been operated at elevated jacket water temperatures in order to reduce the corrosion effects when burning sour gas as fuel. In the event of having to burn sour gas at a future time in some of the Agua Dulce engines, trouble with acidity will not occur because the cooling temperature with Vapor

Phase is constantly higher than the dew point and acid fumes therefore remain in the form of inert gas until exhausted to the atmosphere.

United Gas Pipe Line Company has a system of 9,651 miles of pipe lines in connection with which there are 44 compressor stations totaling 167,915 hp. During a general expansion program in 1951-1952 the company built the Agua Dulce compressor station and installed four 8 cylinder V type Ingersoll-Rand engine and 90° angle compressor units rated 440 hp each at 400 rpm, equipped with conventional closed cooling systems using radiators with belt driven fans. Their operation has been very satisfactory. In 1954 a new addition was made

View down the line of the Ingersoll-Rand 880 hp gas engines driving 90° angle compressors in the Agua Dulce station of the United Gas Pipeline Co.



to the plant and the five Vapor Phase cooled 880 hp Ingersoll-Rand compressor units were installed. This increased the station power from 1760 to 6160 hp. In 1956 one of the Vapor Phase cooled engines and its cooling system was converted to utilize the steam generated to operate a low pressure turbine to drive the cooling fan. The existing arrangement of pumps and hydraulic motor drive for the fan was retained as a stand-by. Modifications of the first arrangement have been made for the three new units to be installed at Cabeza Creek. Dispensing with some of the components of the first installation will reduce initial cost and further improve the performance.

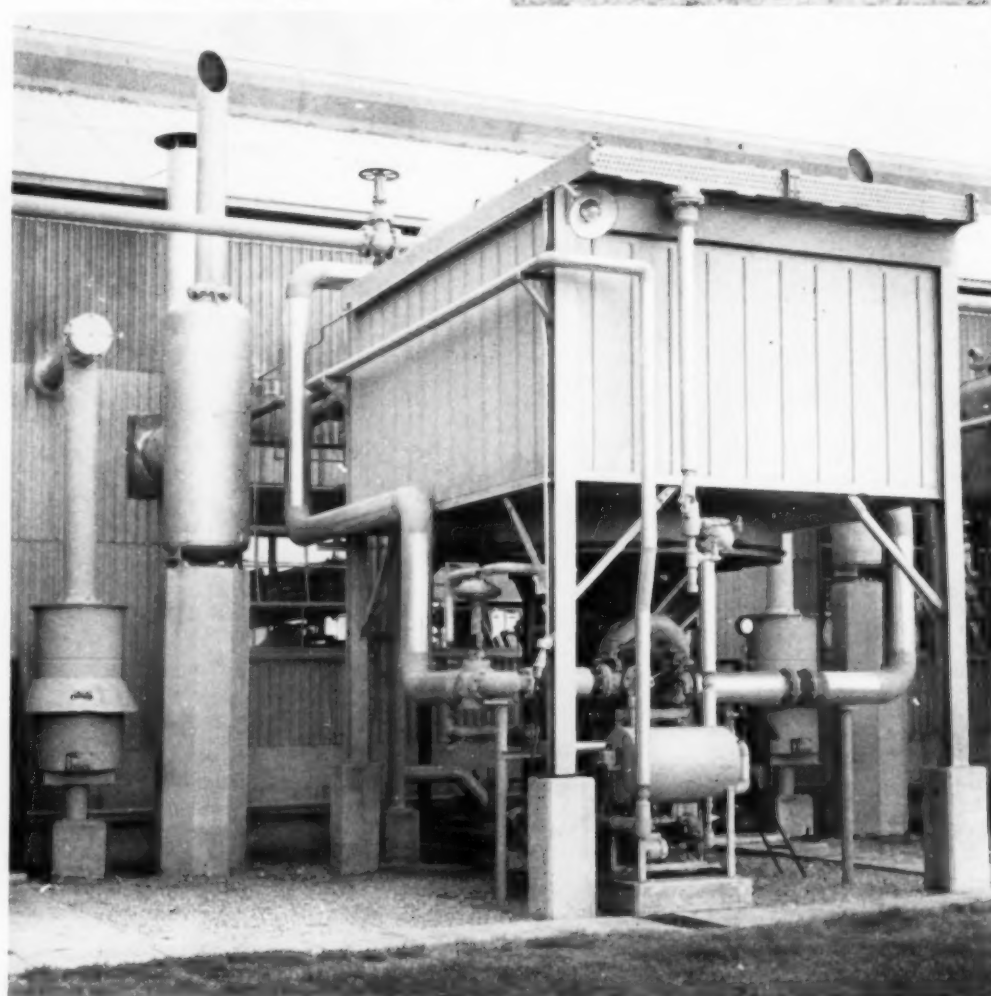
Although the Vapor Phase system is well known, a brief recapitulation of the method of its operation at Agua Dulce is in order. Instead of pumping the jacket water through a heat exchanger and controlling the outlet temperature, the coolant is raised to the boiling point and flows by thermal circulation into the Vapor Phase unit which is a cylindrical steam separator with an outlet pipe at the bottom connected to the lower jacket manifold on the engine. Steam in the separator rises to a fan cooled condenser from which the condensate is returned via gravity to the engine cooling system. Meanwhile the water in the lower part of the steam separator having cooled slightly brings about a specific gravity differential between the down-flow and the water and steam mixture in the jackets and causes continuous circulation up to the steam separator. The result is rapid circulation with low temperature rise, uniform cooling of the jackets and automatic temperature control. One part of the fin-fan cooler acts as a steam condenser and another section cools water which in turn is circulated through the lube oil cooler by an engine driven pump. The Vapor Phase units are tied together by equalizing lines to maintain heat in the jackets of an idle engine. Condensate from the upper equalizing header flows down an 8 in. pipe to the top of the idle engine and sets up slow reverse circulation. There is also an equalizing header at the bottom of the system. A thermal vent of bellows type is installed to release air as the engine jacket fills. It closes automatically when the engine is started and the temperature rises to the boiling point. It also acts as a vacuum breaker. The vent cannot stick and trap air or other noncondensibles in the system which would build up pressure due to expansion without condensation. When the system is filled, a float switch, ordinarily controlling the condensate pump, actuates as an alarm to warn of low water. All of the heat dissipated in the jackets is carried off in the water and steam mixture to the separator.

To drive the fan installation all five engines were initially equipped with oil pumps which provide pressure for operation of 20 hp hydraulic motors, now driving the fans for four of the five dry air coolers. In converting one unit to turbine drive the original pumping equipment was left intact pending subsequent determination of the practicability of the change. To supply steam for the turbine it was necessary to raise the cooling temperature to about 235°F. At 15 psi gauge it appeared that the turbine speed would be 3,000 rpm. In actual practice the minimum pressure at which the turbine will run is 5 psi. Cooling temperature varies from 228° to 235°F according to engine load

and ambient temperature. The turbine speed does not reach 3,000 rpm at 15 psi but this speed is more than is needed for adequate cooling. To convert to turbine drive a 6 in. pipe was run from the top of the Vapor Phase steam separator to the turbine installed below the dry air cooler. A 4 in. diaphragm operated pressure regulator was installed ahead of the turbine. The exhaust steam was piped through an open line to the condenser and a by-pass with a valve in it was installed around the turbine. A separate condensate tank was connected to the condenser by a 2 in. pipe with a float trap in it. Accumulations of condensate in main steam and exhaust lines is carried to the condensate tank through smaller pipes and float traps. In addition to the V-belt driving the cooling fan, the steam turbine drives a small rotary pump which returns all condensate to the engine cooling system. During starting operation a small electric motor driven condensate pump is placed in service. In view of the success achieved with turbine drive for one cooling fan, consideration is being given to similar conversion of the other four engines at Agua Dulce.

In the new part of the Agua Dulce station the five Ingersoll-Rand engine-compressor units equipped

Cooling system installation of Vapor Phase cooling and steam turbine driven cooling fan drive. Note from left to right: American Cycoil air filter, Burgess Manning exhaust silencers, steam turbine fan drive in middle of cooling tower. Vapor Phase steam separator is in back of cooling tower next to building.





The Agua Dulce Gas Compressor Station, which has four 440 hp Ingersoll-Rand gas engines and five 880 hp Ingersoll-Rand gas engines installed. The five larger engines are housed in the large building addition at right and feature Vapor Phase Cooling.

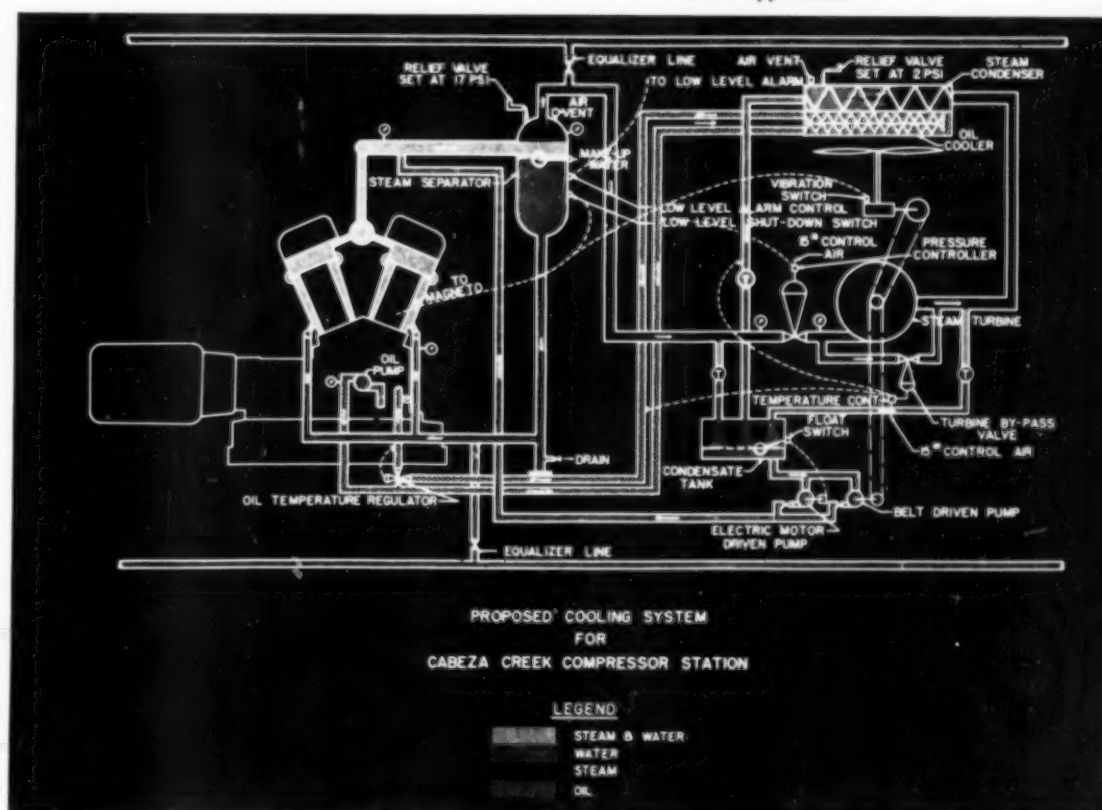
with Vapor Phase cooling are 4 cycle 8 cylinder V type spark ignition engines rated 840 hp each at 330 rpm. The bore is 15½ in. and the stroke is 18 in. Each engine has two 90° angle attached compressors of double-acting crosshead type with 10½ in. bore and 14 in. stroke. The service rating is 1000 psi. The station is built of pre-fabricated steel frames with heavy corrugated asbestos roof and side walls. It is well lighted, ventilated and immaculately clean inside. The first section was erected to house the four 440 hp Ingersoll-Rand engine compressors and a matching extension was built later for the five 880 hp units of the same make. Overhead traveling crane lifting facilities are provided for engine repair work. Silencers and air filters are installed neatly along the outside back wall of the building in line with the Vapor Phase units for the five big engines. All of the engines operate independently with separate attached water and oil pumps. There is a complete system of lube oil filtration and full instrumentation of each one. By this method of installation no one engine is dependent upon any of the others nor any outside power source. Since the Agua Dulce area is one in which tropical storms are not uncommon an emergency generating set is installed in a separate building outside the engineroom. This is a 6-cylinder Allis Chalmers gas engine driving a 3-phase 60 cycle 440 volt ac generator with 80% power factor.

Although very little water goes to waste in the cooling systems there is a deep well pump which provides an adequate supply of water for the entire installation. A separate building, air conditioned and comfortable, houses offices for the dispatcher and the chief engineer. All fuel gas is passed through a liquid wash type scrubber before it is burned in the engines. In the same building with the emergency generating set there are two motor driven 2-stage air cooled compressors which supply starting air for all of the compressor engines. Gas is now pumped at the Agua Dulce station through the main line to Refugio to combine with gas from the wet low pressure wells with high pressure gas from the coastal recycling plant. Wet gas is processed through the Agua Dulce gasoline plant and then compressed by the original compressor facilities. All of the gas except that from the coastal recycling plant is compressed by the new units. It is dehydrated before being pumped to mains.

#### Agua Dulce Equipment List

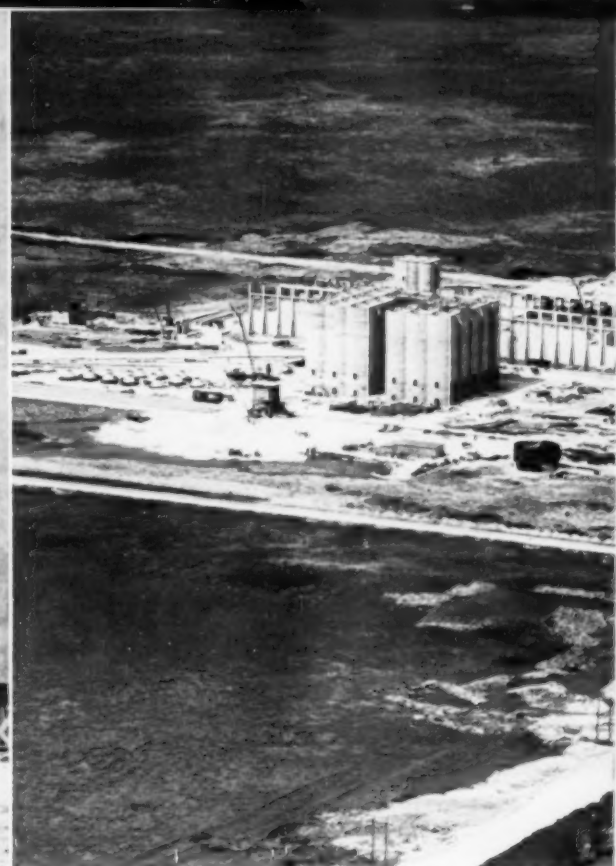
Fan assembly	Koppers
Hydraulic fan drive	De Laval Steam Turbine
5 Engine-compressors	
880 hp	Ingersoll Rand
4 Engine-compressors	
440 hp	Ingersoll Rand
5 Vapor Phase systems	
(5 engines)	Engineering Controls
Silencers	Burgess-Manning
Air filters	American Air Filter
4 Radiators	Young
Ignition system	American Bosch
Emergency generator set	Allis Chalmers

Schematic diagram of the proposed Cabeza Creek Compressor Station installation, which will feature a refined version of a steam turbine driven cooling fan drive in connection with Vapor Phase cooling on gas engines. This system features new designs gained from experience with the Agua Dulce application.





Two of the 5 Euclids 15 yd dump trucks powered with General Motors 6-71 diesels rated 218 hp at 2100 rpm. They have Fuller transmissions, Bendix Westinghouse air compressors. Behind them are several of the giant 10,000 barrel cement silos.



The new plant of the Lehigh Portland Cement Co., under construction, located a 1/2 mile back in the Florida Everglades and 14 miles west of Miami. It is expected to be in operation this year. The elevation of the land here averages up to a foot above sea level.

## CEMENT FROM THE FLORIDA GLADES

By ED DENNIS

**L**EHIGH Portland Cement spent 23 million dollars to save its customers 15 cents on a bag of cement. Construction engineers are helping to push back the Florida Everglades and build a 23 million dollar cement manufacturing plant on the Tamiami Trail near Miami, Florida. This new city of steel and concrete will turn 3100 acres of waste Glades land into one of South Florida's major industries.

The Lehigh Portland Cement plant is located a mile and a half back in the Everglades and fourteen miles west of Miami and when completed will employ several hundred persons. The first construction workers had to come in with swamp

buggies to work the dieselized draglines and dozers and scrape off the sawgrass plus a half million yards of glades muck to reach bed rock. Then tons of rock had to be dumped in to bring the building site up to approximately nine and a half feet above sea level.

It was a continuous struggle between the several General Motors diesel driven low lift water pumps and the water-logged Everglades. Special underground "well points" had to be driven into the rock to win the battle with sub surface water. In South Florida water doesn't act like it does in any other place in the states because of the underground porous oolite rock. The plant when completed will produce about two million barrels of cement yearly, figuring four 94 lb bags to a barrel; that's a lot of cement.

A giant Bucyrus Moneghan 9W dragline, with a 200 foot boom, will dig the soft oolite rock and stock pile the material. Then several #101 Marion

shovels will load it on 15 yd G. M. dieselized Euclid dump trucks which will haul it to be pressure crushed by a giant jaw crusher machine. Several minerals are added to the coral rock such as aluminum, iron and silica. Then it is burned to clinkers in rotating 475 foot kilns. The clinkers are ground to dust and the resulting product is cement. Special Fuller 17 and 19 inch cement pumps with air pressure are used to fill the thirty 10,000 barrel silos with the finished product.

Two 45 ton General Electric yard locomotives, powered with two model H600 150 hp Cummins diesel engines, will be used to switch the freight cars around the yard. Transportation for the cement will be provided by special railway cement cars. The Seaboard Railroad had to construct miles of new railroad bedding across the glades for the new plant. Over 6000 tons of steel reinforcement went into the building of the huge 864 foot long storage building. Its sides were poured concrete sections weighing 220 tons and moved into position on railroad tracks.

Portland cement doesn't come from a location of that name. It was named Portland because Joseph Aspdin, the English mason who invented the first dependable scientifically made cement in 1824, thought it resembled the rock quarries on the Isle of Portland off the English coast. The Portland Cement Association, which is supported by over 70 cement manufacturers in the United

◀ L to R, David Kittrell maintenance superintendent of Lehigh Portland Cement Co. and Lee Mahan sales engineer of Cummins Diesel Engines of Florida Inc. inspect one of the two General Electric 45 ton yard switch locomotives. Each of these are powered with two model H600 Cummins diesel engines rated 150 hp at 1800 rpm, General Electric dc generators and Gardner-Denver air compressors.





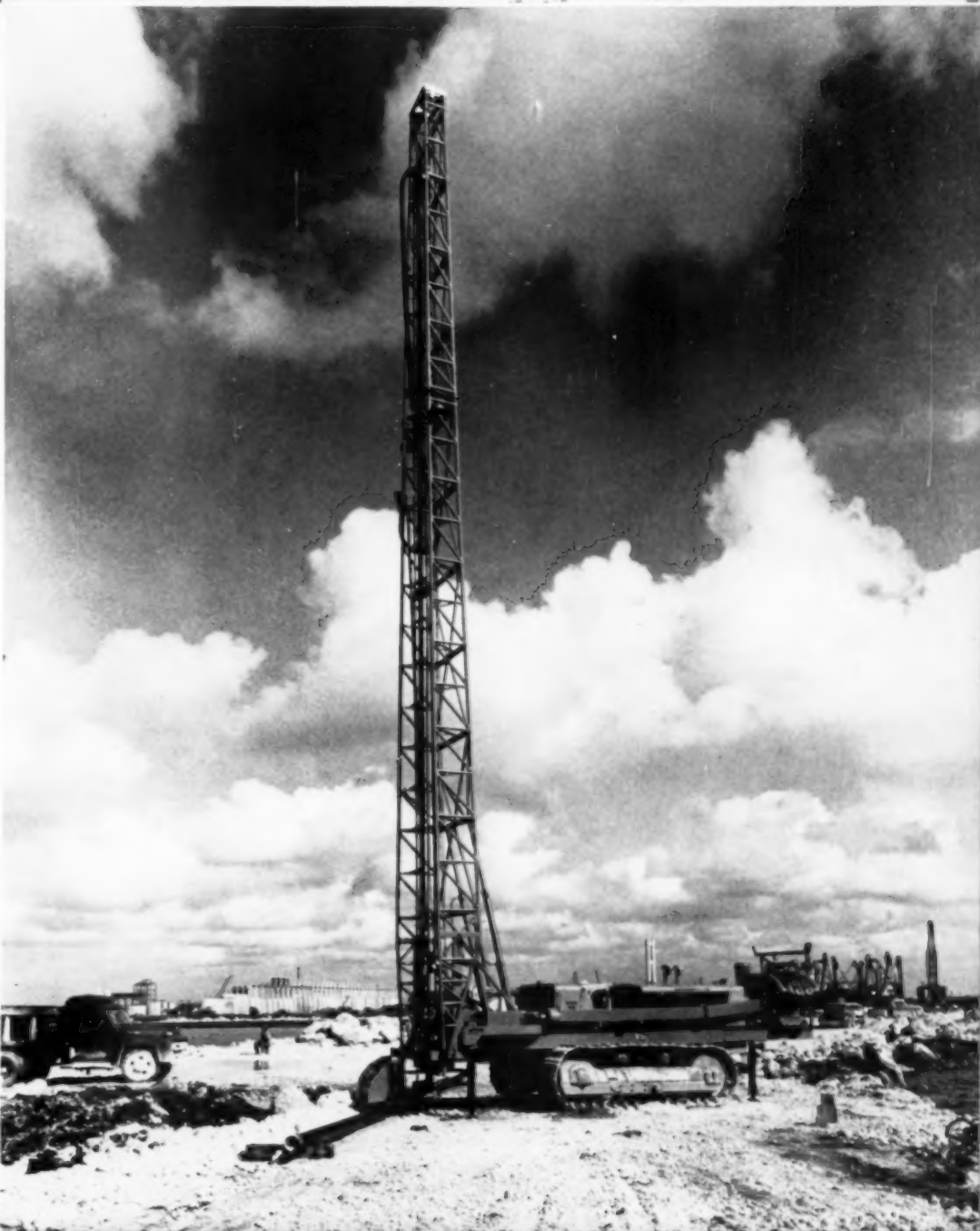
Several of the G. M. dieselized 15 yd Euclid dump trucks ready for loading. A Northwest clambucket with a Murphy diesel and Twin Disc clutch loads rock material into a rock crusher, the crushed rock will be used on construction work around the new plant.



States and Canada, carries on continuous experimental work in its \$3,500,000 research laboratory near Chicago to bring about new developments in concrete. Some of the heavy duty dieselized construction equipment working on the building of this cement plant includes, 2 Manitowoc Speed cranes with 130 ft booms plus 30 ft jeb booms. These are powered with Cummins diesel engines; Several Northwest cranes and back hoes with Twin Disc clutches and Murphy diesels; Five 12 yd Euclid G. M. diesel dump trucks; Three Gardner-Denver air compressors powered with D1300 Caterpillar diesels; And a Mayhew dynamite drill rig mounted on a Caterpillar D8 tractor. About the most important pieces of dieselized equipment were the several portable low lift water pumps powered with 6-71 General Motors diesels.

During the building of the roads to the plant site, several Caterpillar D8 push blade tractors and model 12 motor graders were used. A small emergency 170 kw generating set, powered by a model D337 series F Caterpillar diesel engine, was supplied for this plant by Shelley Tractor & Equipment Co. In a few short months, when the city of steel and concrete is completed, it will be another battle that was fought and won by man against nature for the wastelands of the Everglades with the use of modern dieselized construction equipment.

The Mayhew dynamite drill rig used to blast holes in the oolite rock. It is mounted on and powered by a D8 Caterpillar diesel tractor. Mounted on the rear end is a Gardner-Denver air compressor.





## DIESELIZED CLIPPER *MARY BARBARA* JOINS PACIFIC COAST TUNA FLEET

By JAMES JOSEPH

**S**OME 127-ft long, her fish capacity 340-tons, the tuna clipper *Mary Barbara* began sea trials in late last December—preparatory to joining nine sister clippers of similar design, all of them from the ways of San Diego's National Steel and Shipbuilding Corp. In many respects, the *Mary Barbara's* launching was historic. For, as 10th in Nassco's famed "standard 340-ton" clipper series, she sails into waters lashed by an economic maelstrom—a storm whipped up by the continuing, and growing, controversy over foreign imports of tuna. The U.S.'s shrinking share of the domestic tuna market (but 289,000,000 pounds from California boats in 1957, compared to 392,273,000 pounds in peak-year 1950) threatens the economic life of such "big boats" as the *Mary Barbara*—and her sisters.

In December, 1957, the American Tunaboat Association, in a statement before the U.S. Tariff Com-

mission, pointed out that the number of clippers operating from the Pacific coast had declined from a high of 210 vessels in 1952 to a low of 153 in 1957. Further, the Association predicted that but 146 vessels would fish during 1958. Moreover, said the Association, "in the past five years, using the average of boats covered in our preliminary survey, there has been an annual profit per year per boat of \$1,002. This represents a net profit per year of 6/10 of 1 per cent on sales and 4/10 of 1 per cent on initial invested capital. On a fleet basis, the preliminary survey shows sales of \$73,530,000 for the 5-year period, reflecting a net profit of 6/10 of 1 per cent or \$441,000—not enough to buy one new 350 ton boat." It is into this heavy-swell controversy that the *Mary Barbara* sails, managed by National Marine Terminal, her catch destined for San Diego's Westgate California Corp. (which packs the "Breast-O-Chicken" brand).

Like her predecessors, the clipper *Mary Barbara* is dieselized, her main engine a Fairbanks-Morse 960 hp at 720 rpm model 38D81½, 6-cyl, 2-cycle, opposed piston, direct reversing marine diesel with a bore of 8.5-in., a stroke of 10-in. The engine drives thru a 3:1 reduction gear. Her two auxiliary engines—both Murphy diesels—drive Electric Machinery generators, rated 125 kw at .80 pf, 156 kva, 240 volts. The Murphy engines are model #24, 6-cylinder, 4-stroke, developing 191 hp for continuous duty at 1200 rpm. Auxiliaries have a bore of 6½-in., a stroke of 6½-in.

As the 10th in the Nassco series, the *Mary Barbara* stems from a long and seaworthy lineage. *Sea Preme* and *Conte Bianco* were launched in 1951—the first of the now much-heralded tuna series. There followed others, including the *Cabrillo* and *Dominator*, both built (in 1954) for Joseph and

George Soares of San Diego. In design and dimensions, the *Mary Barbara* is much like her sisters. Her fish capacity is 340 tons, her loaded displacement some 765 tons. Her length, overall, 127 ft; her beam (moulded), 30 ft 6 in.; moulded depth, 14 ft 6 in. and maximum draft aft, loaded, 15 ft 8 in. She carries 48,551 gallons of fuel, 4000 gallons of fresh water, 1600 gallons of lube oil and quarters a crew of 15, including her skipper, George Zulloff. And, like her sisters, her design was predicated on the facts of fishing—as increasingly, clippers must travel farther to find the catch.

Says naval architect Wendell H. Calkins, "with the increases in distances traveled . . . has come a need for increased hull and propulsive efficiency . . . to offset the heavy fuel carrying requirements and the time required for traveling to and from the fishing grounds." Crew quarters are engineered for long-voyage comfort (interiors are harmoniously painted to relieve boredom). Two sizable refrigerated storerooms (one for vegetables, the other for meat) keep the galley and its diesel-fueled Ingle range well supplied. In layout, the *Mary Barbara* follows the general design of her forerunners: her stern, fitted with fishing racks, is low (almost awash) with stern deck space for 20-25 tons of freshly caught fish. Points out architect Calkins, "these requirements . . . a low deck at the stern, large volumes of water above and below deck, and deck space for loading fish . . . create a reduction of stability and reserve buoyancy to the extent that extremely thorough and careful engineering is necessary to avoid producing a . . . cranky and unstable vessel. These vessels have sufficient beam and void flotation space in the stern and shaft alley to give ample flotation and stability. This is further

enhanced by the rapid rise of the deck line forward of the bait box to give more freeboard amidships. The full watertight transverse bulkhead at the aft end of the galley also contributes immeasurably to stability by eliminating the side alleys with low freeboard and dangerous wing doors."

The main engine room lies beneath the crew's quarters, wheel house and chart room. Six brine wells (varying from 15.5-ton capacity to 31.3-ton) line each side of the shaft alley, aft of the engine room and on its same level. Bait is carried in all but two wells. Fuel may be carried in the two wells furthest forward and aft.

The engine room of the *Mary Barbara* is dominated by its main propulsive engine, the 960 hp Fairbanks-Morse. The engine (fresh-water cooled) drives thru a Universal reduction gear, flexibly coupled to the engine. Propeller shafting is 61½-inch diameter with the tail shaft section of monel. Line shafting is supported by Nasseco's standard ring oiled shaft bearings. The five-bladed propeller—by Columbian Bronze Corp.—is 90 in. x 74 in., style M.E. The main engine, turbocharged, is air-started from two 30 in. x 96 in. compressed air receivers (250 psi working pressure). Mounted on the bulkhead wall forward of the main engine is the main engine's gauge board, monitoring (1) starting air; (2) water temperature; (3) scavenging air; (4) lube oil and (5) fuel oil. Midcenter of the panel is an Alnor exhaust pyrometer, with separate switching for each cylinder of the main engine. Switchgear (by Nasseco) for the auxiliary engines is mounted to left of main engine board. In ventilating the engine room, designers worked on the principle that in addition to supplying

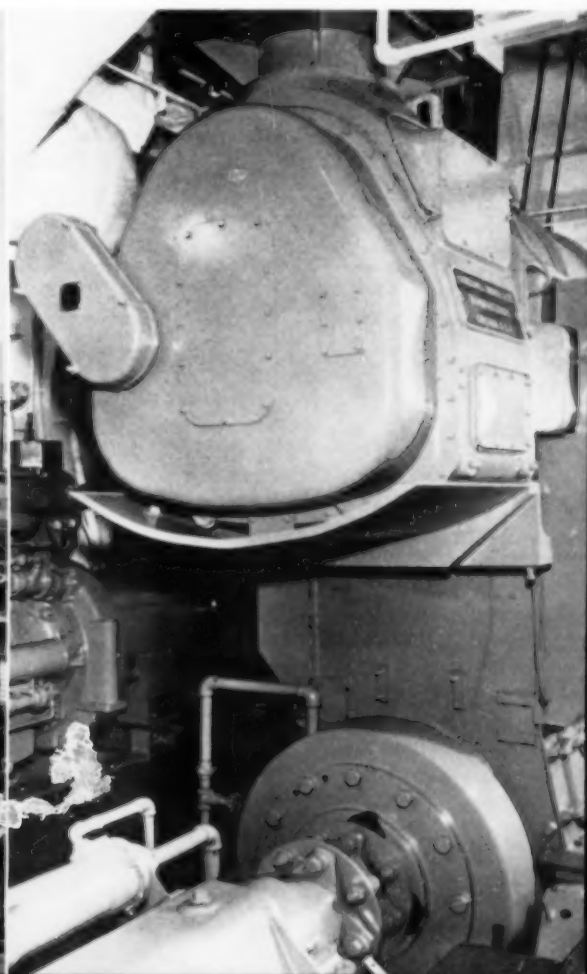
fresh air, it's also both necessary and desirable to remove excess heat—generated by the machinery. Thus, a 5000 cfm exhaust blower works in the fan room on the bridge deck, drawing air from the engine room thru the stack casing, and exhausting it to atmosphere thru the aft end of the fan room. The 10,000 cfm fresh air axial fan is housed in the net room. Atop the pilot house stands a steel tripod—which mounts crow's nest and radar antenna. Significantly, this tripod is forward of the engine exhaust—this, to avoid exhaust fumes in the crow's nest, inevitable had the nest been mounted, as on most vessels, atop the mast (which stands aft of the exhaust port). Interesting is the clipper's rudder—designed for maximum response in following seas.

Explains naval architect Calkins, "it was believed that, if a rudder could be developed which gave the required turning effect at a smaller rudder angle, much less effort and spinning of the steering wheel would hold a true course. After investigation, a new airfoil section was selected. The rudder is considerably thicker and has its maximum thickness further aft than usual. There is also a pronounced hollow to the section near the trailing edge." Equipped with a Sperry-gyro system, the vessel may be automatically or manually steered. The Sperry hydro-electric steering engine, which is connected by chain drive to a 4-inch steering unit mounted on the rudder stock's upper end, can be remotely actuated from the port bridge wing by a lever-type control and rudder angle indicator. Named after Mrs. Mary Barbara Smith, mother of Nasseco's president, C. Arnholt Smith, the *Mary Barbara* will, by the time this article sees print, have headed for Pacific tuna waters.

Tenth in a series, the tuna clipper *Mary Barbara* built by the National Steel and Shipbuilding Corporation, is a 340 ton capacity, 127 ft by 32 ft 6 in., draft 13 ft 8 in. clipper powered with a six cylinder, 960 hp Fairbanks, Morse opposed piston diesel (see illustration to the right). This is one of the first Fairbanks, Morse two cycle engines of the O-P group to be put into service turbo-

charged. Principal equipment aboard consists of Woodward Governor; fuel oil centrifuge, DeLaval; exhaust pyrometer, Alnor; exhaust muffler, Kittell. The two Murphy auxiliary engines are equipped with Electric Machinery generators and Ingersoll-Rand air starters.

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# SUGAR BEET TECHNIQUE

**California Sugar Beet Growers Have Balanced Management and Tractor Power Rising to Most Efficient Food Producer to Help Consumer, Labor, Farmer.**

*By F. HAL HIGGINS*

**T**HE sugar beet grower in California is sitting on top of the farming world from three fundamental standpoints: service to his boss, the consumer; to give the public plenty of cheap sugar; equipping his labor to permit high wages and living standards; and meeting competition of other crops and areas to hold his position and gains. Diesel manufacturers and their sales and service can take pride in their part in tooling up this efficient farmer with tractors, trucks and engines over the past quarter century. Diesel tractors went into the field to prepare the deep sugar beet seed-beds from the first crawlers off the lines, Caterpillar, International, Allis-Chalmers, Cletrac, Oliver, Case, Ford and Minneapolis-Moline diesels with engines of those brands as well as Hercules, Waukesha, Buda (now Allis-Chalmers), Atlas (now White) all had their repowering roles as the California sugar beet grower made the change-over from gasoline power during the past 27 years of the rise of the diesel tractor. Diesel cost-cutting power was made to order for the big power-minded California sugar beet grower, and he welcomed it as a major cost cutter in getting out of the depression. And the oil industry with its refineries and distributors blanketing the beet growing areas did



Land preparation starts the sugar beet crop program. Here a Landplane puts the finishing touches on a beet field that has been chiselled and disked. Diesel crawler tractors power these in nearly all California sugar beet fields.



Mechanical harvester which has replaced a 25-man crew struts through Alameda County sugar beet field. In one operation this rig digs beets out of the ground, shakes loose dirt, chops off leaves, and tosses roots into truck running alongside.



Special machines like this combined lister, fertilizer, bed-roller and planter are often built by resourceful sugar beet growers.





Huge tank truck, with Cummins diesel, one of a fleet constantly shuttling in and out of Alvarado factory, takes on load of liquid sugar destined for canners, bottlers and other food manufacturers in this area. So popular is this new form of sucrose that it formed about 65 per cent of factory's total sugar production in 1957.

a magnificent job in getting the correct fuels and greases out to the tractors, with advice as well as the oil field products to keep the tractors and engines working at top efficiency from the rugged pioneer days of diesels in the 1930's up through war and post-war stretches. Of the five top name speakers on the luncheon program of the 27th annual membership meeting of the California Beet Growers Association at the St. Francis Hotel in San Francisco recently, Mr. Dudley Smith rang the bell with the growers in acknowledging the rating of these men who grow the beets. Mr. Smith is vice-president of the Association of Sugar Producers of Puerto Rico and spoke as an official of the arch-rival cane sugar producers. Also, he has been all over the sugar producing world in studying the problems of production. California beet growers are producing about two and one-half to three times the sugar per acre as the rest of the world,

Smith said. "This level of production and this efficiency in the utilization of agricultural land seems to be unsurpassed in the entire sugar world."

The second standard by which domestic production, including that of California, can be evaluated is the amount of sugar produced per man day of field. Smith continued. All of the domestic areas have shown distinct upward trends in this regard in the past ten years or so. In the beet fields the trend has not been as sharply upward as that in the cane areas, due largely to the fact that much of the increase in labor efficiency occurred prior to the start of this ten-year period. One day of field labor produces approximately 380 lbs of sugar for all domestic sugar areas of the U.S. The average for the entire sugar cane world outside the United States probably does not exceed 80 lbs of sugar for each man day of field work. It is all due to American management, research and determination to do the job better, concluded Smith. The owners of the sugar industry retain little of the fruits of this advanced technique for themselves. Instead it is reflected largely in the price that the consumer pays for sugar and in the wage rates the grower pays his labor. Sugar field rates in the U.S. are the highest in the world. The average real wage is more than two times higher than that on farms producing for the so-called world market from some areas. Four minutes work of the average U.S. industrial worker is more than enough to buy him a pound of sugar today. The efficiency with which labor is used in planting, growing and harvesting sugar crops makes the difference between U.S. and many undeveloped areas of Asia.

Director Lawrence Myers of the USDA's sugar division, explained the problems of allotting acreage increases in various areas of the U.S. as cane vs beet sugar producing areas and off-shore cane sugar areas were balanced by the Government to produce enough sugar for the consumer without overproduction and ruinous prices to the grower. California growers averaged 21.67 tons of beets per acre last year, said J. Earl Coke, Vice-President of Bank of America. This was an all-time high and topped the national average of 17.4 tons. Coke, a veteran of the rise of California sugar beets over the pre-war and war years as an official with Spreckels Sugar Co., praised the wise management decisions that had lifted California growers to the top. He also predicted 1958 would be a good business year. A saving of at least \$10,000,000 to the nation's sugar beet producers during the past ten years has come about from an investment of but a half million dollars invested in sugar beet research by the USDA's Western Utilization Research Branch at Albany, Calif., according to Dr. Rolland M. McCready, head of sugar beet investigations at the western laboratories at Albany.

These California beet farmers not only produce over a billion pounds of sugar annually, but also grow some of the 216 commercial crops of this state, McCready pointed out. Seen among the record turnout of growers from all areas of the state from the Imperial Valley on the Mexican border to the fields above Hamilton City in the Sacramento were the Blackwelder brothers of Rio Vista, builders of the Blackwelder beet harvester that now harvests 95% of California's crop. The Blackwelder harvesters start with the old spike-wheel

Marion of 1942 that called for the biggest diesel Internationals, Cats, Allis-Chalmers and Cletrac tractors for power. In recent years, the Blackwelders have developed beet harvesters for the average farm to go with any of the wheel tractor of sufficient power. "Of course, the diesel tractor is best for this job," said Ernie Blackwelder, when he was quizzed at the meeting on their new model for 1958.

Having watched the various steps towards the seemingly impossible mechanizing of the age-old stoop labor crop of sugar beets from North Dakota to California with looks at Colorado, Utah and Idaho beet farming and processing over the past quarter century, the writer asked California officials of their Beet Growers and Western Beet Sugar Producers, Inc., to set down the facts today. Director Gordon Lyons of the California Growers, Austin Armer, president of the American Sugar Beet Technologists, and editor of Spreckel's Bulletin for growers, and Lee Goodman, regional Manager of Western Beet Sugar Producers agreed on the following facts on mechanization of the sugar beet in California:

#### PROGRESS IN SUGAR BEET FIELD MECHANIZATION

Operation	Percent of Crop Cost	1942	1958	Near-Future
Land Prep.	10	M	M	M
Planting	4	M	M	M
Fert.	10	M	M	M
Thinning	20	H	H, M	M
Cult.	7	M	M	M
Hoeing	14	H	H	M
Irrig.	7	H, M	H, M	M
Topping	20	H	M	M
Loading	8	H	M	M

Notes: H = Hand  
M = Machine

Above figures for "Percent of Crop Cost" are median; extremes vary widely from this figure.

Mechanization is a relative term. No machine operates without a man to direct it. Thus, Mechanization means a major reduction in man hours.

It takes a lot of rugged crawler tractor power to pull the old model "spike-wheel" beet harvesters that came out of a blacksmith shop near Rio Vista in 1942 to begin taking over the California beet harvest and keep this crop in the state's farming system under war shortage of hand labor.



# WICHITA AIR OPERATED CLUTCH

**A** NEW type of air operated clutch for the transmission and control of marine propulsion power has recently been announced by the Cleveland Diesel Engine Division of General Motors and the Wichita Clutch Company, Inc. This clutch assembly consists of a pair of disc type single clutches actuated pneumatically by air tubes which force friction discs and floating plates together. The main advantages of this new clutch are: 1. Positive control of propeller speed throughout its entire range. 2. Smoother operation with single lever remote control. 3. Quick response which gives the operator "feel" of the vessel. 4. Sharply reduced maintenance costs.

This new clutch has been in service on The Great Lakes Towing Company's tug, *Utah*, for over a year. It was installed early in November, 1956 and has since been assigned to all of the roughest jobs available in The Great Lakes Towing Company service. In addition, it has been used frequently for demonstrations and tests under conditions much more severe than could ever be obtained in actual work operations of any tug or towboat. The clutches have now completed more

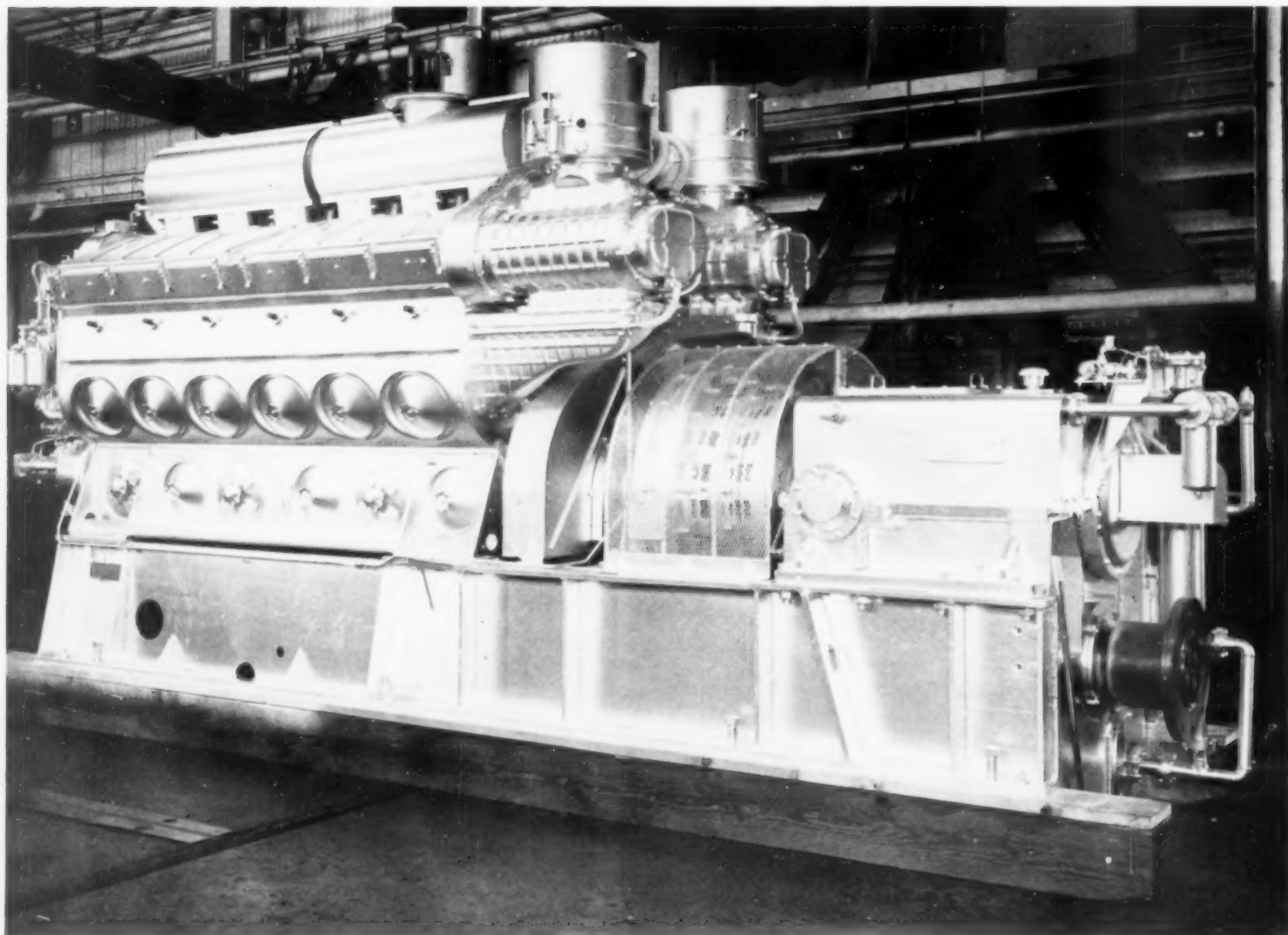
than 3600 hours of operation under these adverse conditions. According to the engineers at Cleveland Diesel and The Great Lakes Towing Company, this tug has exceeded all expectations in its daily duties of handling large ore vessels in the confined waters of the inner harbors at Cleveland and Buffalo, and as a result of this impressive record, The Great Lakes Towing Company has ordered these clutches for seven more tugs. The first application on the East Coast has recently been placed in service in the tug *Athena* operated by the Boston Tow Boat Company. Other installations soon to be completed are tugs for: Bush Terminal Company of New York; Mechling Barge Lines, Inc., of Joliet, Illinois; Newtown Creek Towing Company of New York; Moran Towing and Transportation Co., Inc. of New York; Turecamo Towing Co. of New York; and a sand boat for the Erie Sand and Steamship Co. of Erie, Pa.

The clutch assembly consists basically of two standard Wichita low inertia type, ventilated clutches each as shown in the accompanying cutaway view (Fig. #1). They have been modified to permit mounting them back to back to insure against any

damaging heat accumulation around the actuating tubes. Each clutch is made up of two basic castings bolted together to form a "U" shaped section opening toward the center. The first is a combined backing plate and driving ring which supports the two friction discs and transmits loads directly through internal tooth splines to the toothed outer edges of the friction discs. The second casting is the air tube holding plate which carries the assembly of air tube, finger plate, and retracting springs. The complete clutch assembly is supported on an adapter, carried by a driving disc which in turn is secured to the engine crankshaft or stub shaft flange as shown on the cross sectional drawing (Fig. #2). Between the two friction discs in each clutch are cast iron floating plates which are supported on hubs on the reverse reduction gear. The forward floating plate drives through gear tooth splines to the ahead hub which is pressed on the main gear pinion. The aft floating plate is similarly supported and drives through splines on the reversing gear hub.

Direction of drive is selected by inflating the air tube of the appropriate clutch. As soon as retract-

Cleveland Diesel model 567C propulsion Engine with Falk model 14 MB reversing reduction gear with Wichita model ATD 130H LI clutch.



ing spring pressure is overcome, the finger plate moves the working parts on their splines and squeezes the floating plate between the two friction discs. Whatever torque is applied to the floating plate from the friction discs is transmitted through the hub teeth to the selected drive train of the reverse reduction gear. The clutch is released by venting the air tube. The retracting springs pull back the finger plate, and all pressure is immediately removed from the working surfaces of the clutch, allowing the floating plate and friction discs to turn freely, independent of each other. During maneuvering considerable heat is necessarily produced. It is effectively removed by air flowing out over the surface of the cast iron floating plate through specially designed radial openings. These radial openings act as a centrifugal blower. This induced air flow also prevents any heat accumulating behind the friction disc where it might reach the air tube. The success of the new clutch is due to its ability to provide controlled slip which permits operation of the propeller at speeds below those corresponding to engine idle speed. In the control of the propeller, full advantage has been taken of the fact that both clutch operation and engine speed can be controlled by a single medium—air pressure.

Propeller direction and speed are both controlled by a single lever which is moved forward from the stop position to go ahead and aft to go astern. The control handle during the initial third of its travel first selects the clutch to be inflated and then applies gradually increasing pressure to it as the handle is moved further from the stop position. This applies gradually increasing torque to the clutch

and therefore a gradually reduced slipping in the clutch and corresponding increase in propeller speed. Any propeller speed may be selected between the minimum drive speed and that equivalent to engine idle speed. As the remote control handle approaches one-third of travel in either direction, the clutch approaches lock-up. At this point the clutch pressure, which is also being supplied to the pneumatic actuator at the engine governor, reaches a value sufficient to start moving the governor speed setting lever away from idle speed. Continued movement of the control handle now increases pressure in the clutch to provide necessary increased torque capacity and at the same time advances engine speed from idle toward full speed. This results in smooth operation throughout the entire speed range.

Quick response is the result of the low inertia of the driven clutch members, the small air volume in the tube, and the soft action of the friction material selected. A simple interlock arrangement in the controls prevents damage to the propulsion machinery. In use aboard workboats, the pilot house remote control station is considered the normal operating station; however, for emergency use a transfer valve and a governor and clutch control valve are provided at the engine operating station. It is also possible to add other remote control stations as may be desired for special operating conditions. Control is transferred from the pilot house station to these other remote stations at the option of the operator. The floating plates and friction discs are the only wearing parts of the clutch. Since the air tubes and finger plates carry no torque, these parts are not subject to

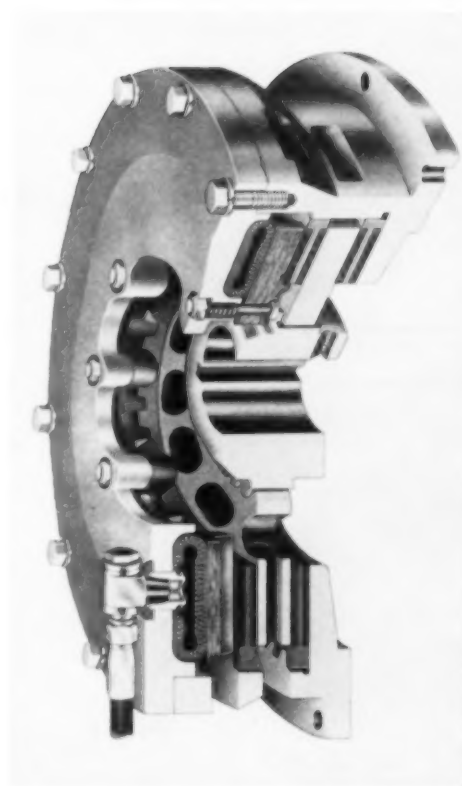
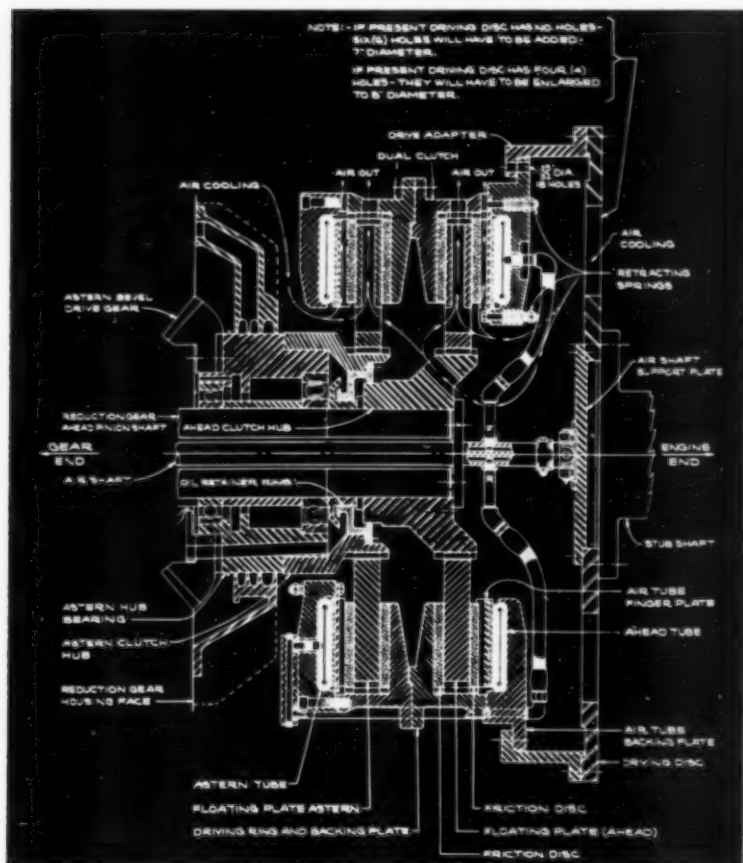


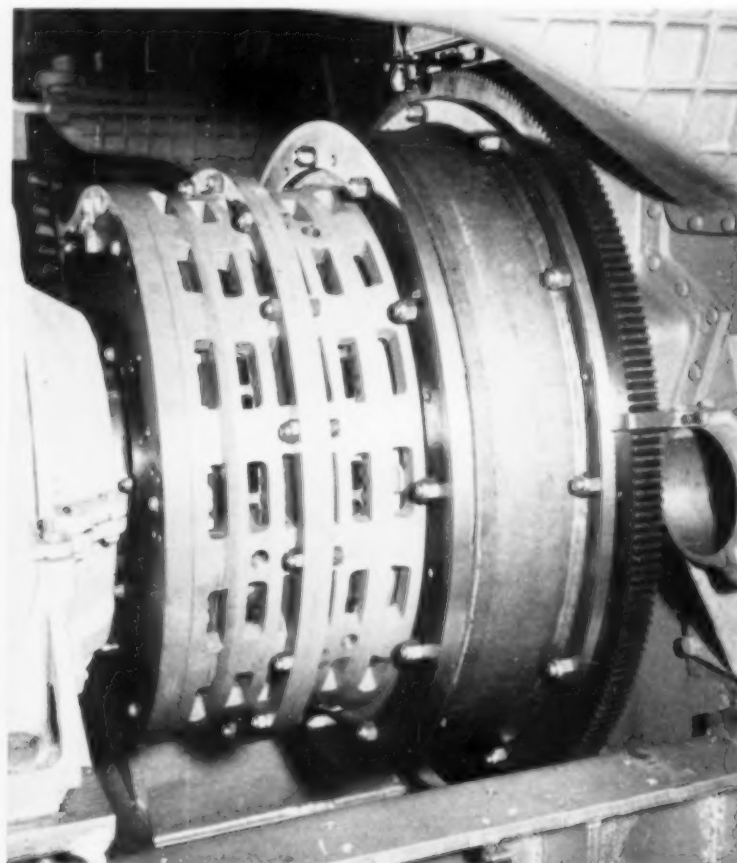
Fig. #1 Typical cut-away view of single Wichita ATD 127 clutch.

wear. The low cost of the wearing parts, and the ease of disassembly give minimum maintenance expense and high availability of the equipment.

Fig. #2. Wichita Clutch Assembly Cross Section.



Wichita model ATD 127 LI clutch and engine adaptor.





By replacing 100 line trucks with 75 Internationals, like that awaiting load (left) at St. Louis waterfront dock, Mid-Continent achieved a 25 per cent economy in power units and tractors while doing the same work volume.

## **DIESELS HELP BLAZE NEW MID-CONTINENT COURSE**

**Motor Carrier Sparks Rebuilding with Methods-Minded  
Executive Timber, International Lightweight Road Units with Diesels.  
And Other Major Moves**

**T**AKE an 11-year-old trucking company whose nine-state, region-linking transport network has run afoul stormy financial weather and give it an injection of adrenalin in the form of dynamic new generalship-plus. You have a motor freight operation that is healthier than the original.

Granted, there's hardly assurance that reorganization, applied to a faltering business, will always have such meteoric results. But that is the startling, if overly-simplified case history which nowadays makes Mid-Continent Freight Lines, Inc., a subject of conversation when truckers meet to talk over affairs of their industry.

Mid-Continent's so-called "renaissance"—a year-and-a-half old this month—started, naturally, with renewed financial backing. The wherewithal to liquidate debts outstanding against the hauler was provided by entrepreneurs familiar with the carrier's valuable operational rights (direct service for markets in Texas, Oklahoma, Kansas, Missouri, Illinois, Wisconsin, Indiana and Ohio, and interchange with connecting lines). Glenn P. Ridge, a system-minded executive who got his traffic education through long experience, was named president and general manager. Then, such well-known motor freight career men as John P. Tarte, H. E.

Norin and John W. Morrison were appointed to round out the company's executive framework—and things began to happen!

Take, for example, the matter of equipment. Under previous management, Mid-Continent was utilizing an un-standard collection of 100 gasoline-fueled rigs to meet schedules in a system so far flung that it embraces Oklahoma City, Kansas City, Wichita, Dallas and San Antonio in the South and West, Evansville, Indianapolis, Chicago, Milwaukee and St. Paul in the North, and Cleveland and Columbus in the East. With an eye on the profit ledger, Mid-Continent replaced the entire road fleet with 75 lightweight-construction, cab-over-engine International DC-405L tractors. All driven with 175-horsepower Cummins turbodiesels, these vehicles—and 100 high-cube, 35-foot trailers—added a \$1 million outlay of new equipment to some \$665,000 worth of city pickup and delivery wheeled gear left in service.

This streamlining was not effected without thought of its inherent benefits in revenue. The 152-inch wheelbase diesels, with 22,000-pound rear axles and five speed transmissions—teamed with aluminum, sliding tandem-fitted vans—gave Mid-Continent a combination tailored to carry uniform

38,000-pound payloads anywhere in its territory. The move also achieved a 25% economy in line haul equipment while doing the same volume of work performed by the replaced 100-unit fleet.

Operating policies likewise felt the strong arm of reorganization. Ridge ordered greater emphasis on LCL shipments. Headquarters were moved from Oklahoma City, in the state of the carrier's birth, to Chicago. "Greater flexibility and more responsive shipper service," was Ridge's explanation for that move. Modifications designed to improve direct teletype service which connects all terminals, implementation of St. Louis as the system's principal dispatch and maintenance point, and more came in the wake of new management's thoroughness and enthusiasm.

To be sure, black figures didn't show up in the Mid-Continent ledger until 11 months after its rebirth. But they have been well in the black ever since. He anticipates the preponderantly International fleet will travel nine million miles and cargo yielding revenues will run 63 per cent higher this year. His sights are on a \$7.5 million gross by 1959. And nobody who has watched Ridge's philosophy pay off to date doubts that Mid-Continent will deliver as predicted.



Shown above beside one of Mid-Continent's new dieselized Internationals is Glenn P. Ridge (left), president and general manager, and J. W. Morrison, Chicago Terminal manager. Firm's general offices were moved to Chicago in 1956.



Preventive maintenance is done on a production line basis at Mid-Continent's strategically located shop in St. Louis. It is equipped to completely service the Internationals' 175-horsepower Cummins turbodiesel plants.



# TWO-IN-ONE LOCOMOTIVE FOR DIESEL AND ELECTRIC OPERATION

**W**ITH completion of the delivery of thirty units of a new two-in-one locomotive originally designed to meet special operating requirements of the New Haven railroad, the Electro-Motive Division has added this model to its standard line of General Motors locomotives. This was announced recently by N. C. Dezendorf, vice president of General Motors and general manager of Electro-Motive. The announcement of addition of the new locomotive, which represents several highly unusual engineering advances, makes it available to any U.S. railroad that has important territory divided between diesel and electric operation and desires to collect the economies made possible by eliminating the operation of two kinds of locomotives. This latest Electro-Motive development combines full range dual-purpose diesel and third-rail electric locomotives in one unit. The new two-in-one locomotives are designed so they may enter and leave third-rail territory hauling conventional passenger or freight trains without even slowing down to change from diesel to third rail power or vice versa. The new locomotive, designated the model FL-9, is just four feet longer than a standard General Motors FP-9 diesel passenger locomotive, despite the fact that the FL-9 contains all the machinery necessary to make it a full range electric locomotive as well as a full range diesel locomotive.

The design concept that permits packing the equivalent of an electric locomotive into a diesel locomotive depends on building the locomotive so that its traction motors can draw power directly from the third rail when the diesel engines in the locomotive are shut down. This ability to use third-rail power is based on a modification of dynamic braking resistors plus newly developed automatic controls. Each FL-9 unit has a 1750 hp, 16-cylinder model 567C diesel engine and four Model D47

traction motors. The unit has a maximum speed of 89 mph. The FL-9 can pull standard passenger or freight trains. It can operate in both Grand Central and Pennsylvania station in New York. The New Haven is operating its thirty units as fifteen 3500 hp two-unit locomotives. They are operating regularly between Grand Central Station and Boston. This territory is electrified at 600 volts dc from Grand Central to Woodlawn, 11,000 volts ac from Woodlawn to New Haven and is not electrified between New Haven and Boston. The new locomotives operate third rail 600 dc electric from Grand Central to Woodlawn and straight diesel from there on to Boston or any other point on the New Haven system. This eliminates the change from diesel locomotive to electric, or vice versa. The engineer remains in the cab to control transition from diesel to electric operation and vice versa. When he is about to leave a third-rail area he starts the diesel engines from the control stand in his cab while the train is still running full speed. With a set of very simple controls the engineer cuts off the third rail and begins drawing power from his own diesel engines. When clear of the third rail he operates the control which folds up the shoes and the train rolls on as a normal diesel. All this can be done without reducing train speed. Entering the third-rail area, the engineer lowers the shoes into running position. He can then switch from diesel to third-rail operation. He next shuts off the diesel engines and runs as a regular electric locomotive. This also can be done without reducing train speed.

To put third-rail pickup shoes on the FL-9, the familiar swing-hanger truck is replaced by the new Electro-Motive developed Flexicoil truck. The Flexicoil truck depends on a rugged, carefully calibrated, double-coil spring instead of the swing-

hanger to control lateral motion. Advantages of the Flexicoil truck are that it includes simplicity, few parts and light weight, and permits the application of rugged, conventional-type third-rail pickup equipment. The Flexicoil truck for the FL-9 is equipped with journal boxes having special ears so that the third-rail shoe beam can be mounted between journal boxes along each side of the truck. From this beam hang the third-rail shoes. When operating from the third rail the FL-9 accelerates automatically, providing another highly useful new feature in this locomotive. The engineer selects on a dial the rate of acceleration which will best avoid slippage but permit attainment of speed in the shortest time. Once this setting is made he opens his throttle. The automatic control then regulates acceleration without the necessity of the engineer manipulating his throttle back and forth to prevent slippage. In effect, this locomotive adjusts itself to track conditions in starting. When the FL-9 operates as a diesel, auxiliary equipment obviously is powered by the diesel engine. These auxiliaries are the ac-driven traction motor blowers and cooling fans. But when the FL-9 operates from the third-rail the diesel engine is shut down. A motor-generator set in the FL-9 powered directly from the third rail then supplies ac power for the traction motor blowers and dc power for lighting and controls. A special 600-volt dc motor drives an air compressor during third-rail operation. Structures leading into Grand Central Station permit a maximum axle loading of 58,000 lbs. To keep within this loading, a three-axle truck is used on the rear. The middle axle is an idler. The outer axles each have a traction motor. The front truck has two axles, each with a traction motor. This provides four traction motors per unit. Heat for the train is provided by the conventional oil-fired steam-heat generator.



# WESTCOAST TRANSMISSION GAS PIPELINE

By JAMES JOSEPH



Follow-up welder joins two sections of pipe as line is pushed through Canadian Rockies at Pine Pass, B. C.



**T**HE vast Peace River natural gas fields were linked to southern British Columbia and the northwest United States early in August 1957 as a final shower of sparks from a welder's torch signalled the end of a great construction project. Several weeks later, Westcoast Transmission Company Limited's President, Frank M. McMahon, gave the signal that started the flow of natural gas to distributors serving the booming industrial Northwest. The story behind the headlines is one of comprehensive investigation, precise coordinated planning, determined hard work and enthusiasm for the future. The idea for this 30 in. natural gas pipeline was conceived by Frank McMahon more than 20 years ago. He made initial engineering and market studies at that time and then set out to prove up the natural gas reserves in the Peace River area. A vigorous exploration program quickly established it as one of the great fields on the continent. It is conservatively placed at five trillion cu ft with many sections still unexplored.

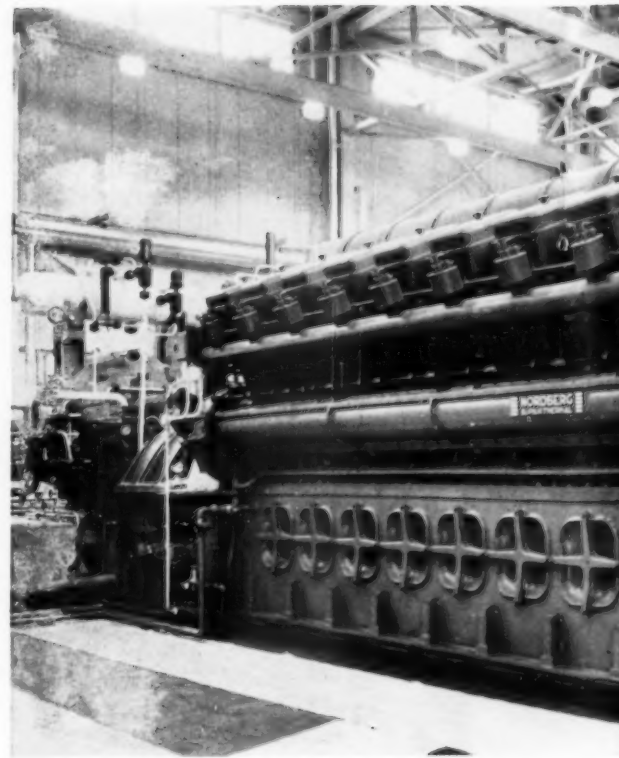
Initially only four compressor stations were erected. They have a combined horsepower rating of 52,500 and are capable of delivering 400 MMcf per day. Station No. 1 has Ingersoll Rand reciprocating compressors and Stations 3, 5 and 7 utilize 16 cylinder Nordberg spark-ignition engines driving DeLaval centrifugal compressors. The stations are planned so that intermediate stations can be constructed later and additional horsepower can be added to the existing stations as required. Construction began in the autumn of 1955 with completion scheduled for September of 1957. Below zero temperatures, huge snow drifts, and spring thaws were greater obstacles than the mountainous, wooded terrain. For example, the movement of heavy equipment was in itself a major task. Since the Pacific Great Eastern Railway initially ran from Vancouver to Prince George, a point 250 miles from the northern terminus of the pipeline, all of the heavy equipment for two of the compressor stations had to be trucked over a crushed stone road, the John Hart Highway. To beat the spring thaw, four Nordberg engines were individually placed on giant sleds and towed by Caterpillar tractors over the frozen highway to the station site. The movement was accomplished in below zero weather at a pace of eight miles per day. The section of the sedimentary basin Peace River area from which the gas is obtained is located in Western Alberta and the Fort St. John section in Northeastern British Columbia. The B. C. gas is rich in liquid hydrocarbons and in hydrogen sulphide. A total of 155 miles of gathering lines lead to the \$30 million treating plant at Taylor, B. C., which is now the largest industry in this northern area. Also located at Taylor is Compressor Station No. 1 and a refinery built jointly by Pacific Petroleum Ltd. and Phillips Petroleum Company for the manufacture of propane and a complete range of motor and aviation fuels. In addition, Jefferson Lake Sulphur Company has built a plant at this location to process the hydrogen sulphide into elemental sulphur, at an initial rate of 300 tons a day.

The clean, dry gas from the scrubbing plant moves directly into the main pipeline. Station No. 1 takes the gas stream from the Alberta fields and starts it on the 650-mile journey. At this station,

6 Ingersoll-Rand single-stage angle compressors, rated 2000 hp each, are driven directly by four-cycle gas engines running at 300 rpm. Almost immediately after leaving Station No. 1, the pipeline takes to the air on a suspension bridge which carries it across the Peace River. This span, which also carries a 26 in. line to bring incoming gas from the Alberta fields to the compressor station, is 1675 ft between towers and longer than the clear span of Vancouver's famed Lions Gate Bridge, and therefore the longest suspension bridge in Canada. From the river crossing, the line works its way west and then south to the international border at Huntingdon, B. C. More than 80% of the terrain along the 650 mile route is covered with forests. There are seven major river crossings, of which six are aerial, 41 railroad crossings and 66 cased highway crossings. The line reaches its greatest elevation at 4700 ft in the Boston Bar Pass of the Coast Range. The actual location of Stations 3, 5 and 7, within a restricted spacing range, was determined after consideration of such factors as accessibility, water supply, bearing strength of soil, etc. Each station is self-contained and designed for non-interruptible performance. Station No. 3 is at Milepost 151, near Fort McLeod, and is reached from the John Hart Highway. The Pacific Great Eastern Railway now passes within several miles of the Station. No. 5 is located at Milepost 320 near Australian in the famous Cariboo ranching country. This Station is also served by both the John Hart Highway and the PGE Railway. Station No. 7 is also served by a major paved road. It is located on the bank of the Thompson River at Savona, which is Milepost 483 along the pipeline. At Milepost 650, near the border towns of Huntingdon, British Columbia, Canada and Sumas, Washington, U.S.A., the line is physically connected to Pacific Northwest Pipeline Corporation's *Scenic Inch*, which comes north from the San Juan Basin of New Mexico.

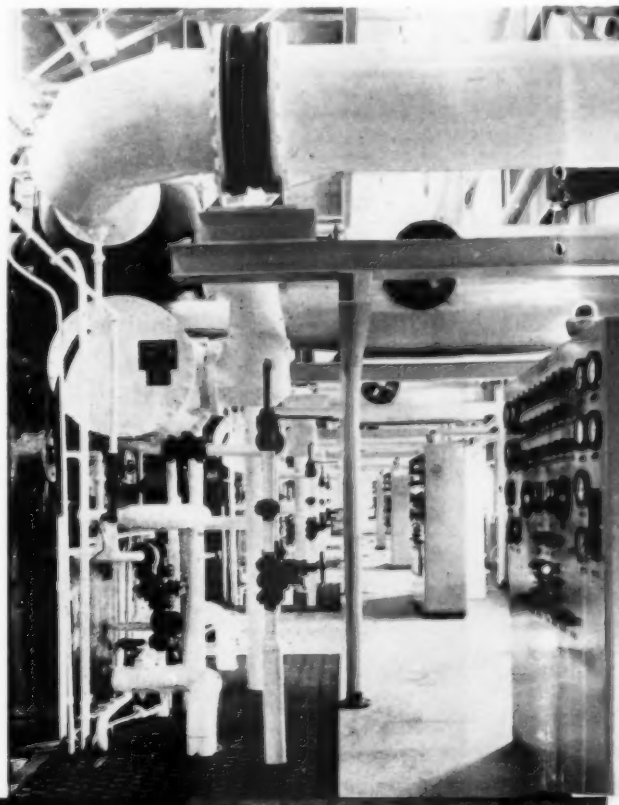
Eleven Nordberg spark-ignition gas engines are presently in operation at Stations 3, 5 and 7. Four engine driven centrifugal compressing units are located at both Stations 3 and 5 and Station No. 7 has three units. The Nordberg type FSE-1316-HSC Supairthermal engines have built-in speed increasing gears and drive DeLaval 24 in. x 24 in. compressors. Each of these V-type engines have 16 cylinders of 13½ in. bore x 16½ in. stroke and are rated 3550 bhp at 500 rpm. The single step geartrain has a 10:1 increasing ratio. The compressors are single stage with a maximum working pressure of not less than 1000 lbs/sq in. The design point of the compressor is at an adiabatic head of 6000 ft lbs/lb and an inlet volume of 5400 cfm. This results in the four unit stations having a compressing capacity of 18,000 hp and Station No. 7 having a total rating of 13,500 hp. The compressors are oil sealed and lubricated by a forced feed lubricating system which is integral with the speed increasing gear's lubricating oil system. Incoming gas passes through scrubbers, which remove all debris and liquids, prior to entering the compressors.

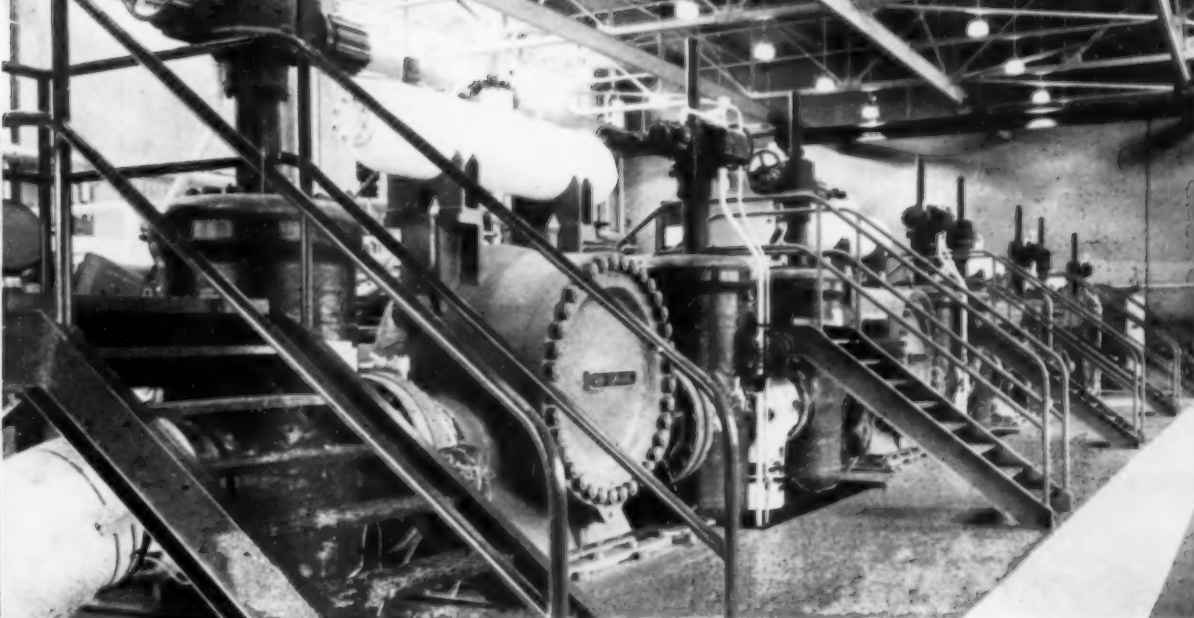
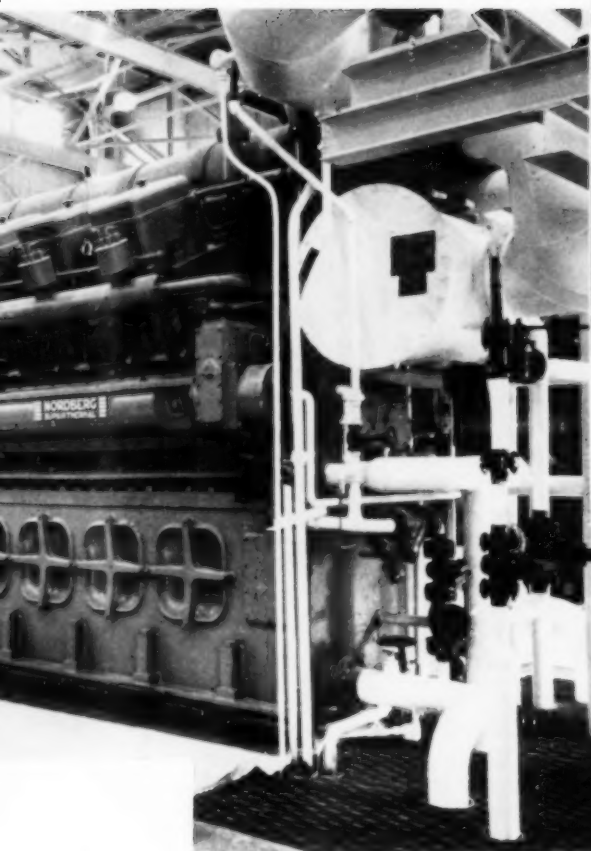
The cooling heat exchanger units have vertical air flow under forced draft. The fan is gear driven by a two-speed, 30 hp electric motor but the shutters for controlling the air flow are manually operated. The units are designed to dissipate 8.6



MBTU/hr from the 288 gpm jacket cooling water at temperatures from 170° to 110° with an ambient temperature of 90° F.

The Nordberg spark-ignition gas engines are started and controlled at a point remote from the engine proper. These controls are semi-automatic at the present time but are designed for easy conversion to fully automatic, remote control. The demand for this new source of fuel is so great that a \$100 million addition was planned even before the line was finished. Ultimately, some stations will have as many as six engine-compressing units and the line's capacity will be increased by more than 50 per cent. In its initial operating phase, the Westcoast line is delivering 300 million cu ft of gas per day. With more compressor stations its capacity will be raised to 660 million cu ft per day.





Close-up of DeLaval 24" x 24" single stage centrifugal compressors which have a maximum working pressure of not less than 1000 psi.

Nordberg Supairthermal spark-ignition gas engine driving a DeLaval single stage centrifugal compressor through built-in speed increasing gears. The engine is rated 3500 bhp at 500 rpm at the installed altitude of 2300 feet.

### List Of Equipment

Engines	Nordberg Supairthermal, Spark-ignition gas, rated 3550 bhp at 500 rpm, 16 cyl, 13½ in. x 16½ in.
Compressors	DeLaval
Turbochargers	DeLaval
Intake Air Filters	American Air Filter
Air Intercoolers	Young
Exhaust Silencers	Kittell
Governors	Massey
Overspeed Governors	Marquette
Actuator Pumps	American Bosch
Ignition Pulse	
Generators	American Bosch
Radiators	Trane
Lube Oil Pumps	DeLaval
Lube Oil Filters	Winslow
Lube Oil Filters	Nugent
Lube Oil Coolers	Ross
Temperature Regulating	
Valves	Amot
Lube Oil Strainers	Purolator
Gas Filters	Winslow
Pyrometers	Alnor
Engine-Generator Sets	Ingersoll-Rand



Front of Station #5 near Australian, B. C. showing 24" suction line and gas scrubbers which remove all debris and liquids before the gas enters compressors. Note: Concrete partition between engine-compressor section (left) and rest of Station.



Front end of four Nordberg spark-ignition gas engines. Note Young intercooler, DeLaval turbocharger, Nordberg gauge board with semi-automatic controls, and Winslow filters.



Rear of Station #5 near Australian, B. C. showing (left to right) Trane radiators, American Air Filter intakes and Kittell exhaust silencers.



# DISTRIBUTOR DIESELIZES WITH DEUTZ: DOUBLES MILEAGE, SLASHES MAINTENANCE

By JAMES JOSEPH

**R**OUND-tripping twice daily between Lucky Lager's Azusa, Calif. brewery and the warehouse of its Culver City distributor, Sunset Beverage Co., are a couple of 830 Diamond T tractors, newly installed with Deutz air-cooled diesel engines, the rigs' 60-ft semi-trailers toting upwards of 1500 cases each trip. Sunset's dramatic switch from gasoline engines to Deutz air-cooled diesels—in January 1957—highlights a growing dilemma among inter-city haulers: namely, that freeway routes, often slowed to snail's pace (or worse) by congestion, are putting engines to some trying tests. Says Sunset's general manager, Sam Frontino, "I'm no automotive expert, just the fellow who matches facts with figures. And our figures—after a year's experience with air-cooled diesels and with more than 40,000-miles on each engine—are the kind that convince."

"Our gasoline engined jobs averaged 31½ miles to the gallon," grins Frontino, "now look at these air-cooled Deutz figures. We're getting 7 and even 8 miles to the gallon, and diesel fuel costs us but 23-24-cents a gallon compared to 26.5 cents for gasoline. Moreover, we've spent not a cent on the engines. Our total 1957 maintenance bill was just \$300—one-fifth of what it was in 1956 when we were gas-engined. Oil consumption," he continues, "is even more impressive—here in the front office where figures speak considerably louder than words. Gas-engined, we were putting in 15-20 quarts a month. The Deutz engines are taking but 7 quarts." More important even than these statistics are the facts of freeway haulage. Briefly: as an engineered fast-link city-to-city, freeways are proving something less than efficient. This inefficiency, conceded by traffic engineers from New York to California, stems from the fact that motorists and fleet-owners alike have flocked to the freeways,

and in far greater numbers than their designers anticipated."

Serving 3700 Los Angeles area liquor licensees (bars, liquor stores, markets), Sunset presently claims a sizable chunk of the Los Angeles beer market. To keep its customers in brew, the distributor's two over-the-road trucks must keep to schedule. One breakdown, for example, can mean "loss" of 1500 cases—a quarter of the day's average 6000 cases trucked into Sunset's Culver City, Calif. warehouse. With summer's rush, the situation for Sunset was even more critical. For then, upwards of 12,000 cases are trucked in as the rigs, on a 5-day week, sometimes make four roundtrips.

Says Frontino, "with 70,000 miles on the gasoline engines—we average 30,000-40,000 miles annually per rig—and with maintenance bills very costly, it was actually cheaper for us to install new diesel engines than to repair the ailing gasoline motors." Moreover, for beer distributors like Sunset, the freeway paradox is compounded. For it's precisely in summer when the two engine-killers—heat and congestion—are worse...and, as beer's traditional season, when Sunset works its rigs hardest.

The Deutz are 4-cycle automotive engines, 8 cylinder, delivering 170 continuous horsepower at 2300 rpm. Engines have a bore of 4¾-in., a stroke of 5½ in., a piston displacement of 486.9 cu in. Air-cooling, still far from common among U.S. diesel makers, was adopted by Germany's Klockner-Humboldt-Deutz AG back in 1942 (when it introduced its first air-cooled automotive diesel). Claimed as air-cooling's prime advantages: (1) eliminated are breakdown-prone water-bearing systems which lead to scale deposits, leaks, over-heating and freezing; (2) air cooling's fast warm-up

slashes both fuel and lube oil consumption, minimizes cylinder wear; (3) hotter combustion chambers, with low charge, mean reduced fuel consumption (as low as .406-lbs BHP hr); (4) there's no water to contaminate fuels or lubricants, thus in crease engine wear. As one researcher claims: "air cooling permits higher cylinder wall and cylinder head temperatures. The masses which have to be brought up to operating temperatures are relatively small. Therefore, the engine warms up to its proper running temperature very quickly. The critical time when the wall temperature of the cylinder and cylinder head is still under 150-degrees F is shorter, compared to water cooled engines. Tests show that at an ambient temperature of 65 degrees F, and even at idling speed, an air cooled engine needs only about 1 minute after starting to reach a wall temperature of 150 degrees F. Comparable water cooled engines, with or without thermostats need more."

Deutz cooling utilizes an axial-flow blower (and in the case of V-engines, such as the F8L-614, the blower is gear-driven and mounted between cylinder banks. Highly-efficient, the blower delivers more than 70 per cent efficiency. Moreover, it is claimed, it absorbs but little power—actually no more than required for driving the fan and water pump of water-cooled engines of equal size. Cooling air is drawn in by the blower (which is mounted behind the truck's radiator grill, where normally the radiator would be). Air is forced at high velocity thru the spaces between the fins on the cylinders and cylinder heads. The heavily finned cylinder head is a die casting of low expansion aluminum alloy, comprising some 700 sq in. of cooling surface. Twenty-eight fins extend the whole length of the cylinders, providing 750 square inches of cooling surface.

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Palletized six-high, part of 1056-case load of bottled beer is unloaded at Sunset Beverage Co.'s Culver City, Calif. warehouse—after over-freeway run from Azusa, Calif.

Sunset Deutz engine installation.





Fuel, in the Sunset Beverage installation, flows via a fuel lift pump (Bosch) to a fuel filter, thence to the injection pump. After passing thru the delivery pipe and injector, fuel reaches the sprayer nozzle and enters Deutz's "swirl chamber". The fuel's pressure lifts the nozzle needle so that fuel is injected as a finely atomized spray. A portion of this spray ignites. As chamber pressure rises (as heat rises), the still unburnt portion of the charge is forced into the main combustion space where it mingles with air and, in the final stage of combustion, is completely burnt. Such complete combustion is one reason why Sunset reports almost no "smoke" from the engines' under-chassis mufflers exhaust. In smog-conscious Los Angeles, that's important.

The engine, moreover, can burn a wide variety of fuels—and with little or no adjustment. Acceptable fuels: tractor fuel, crude oil, kerosene, jet plane fuel...and even gasoline. Says Sunset's owner, John B. Richter, as a Deutz-rig unloads, its trailer's bed roller-equipped and carrying twenty-two 40 in. x 40 in. pallets, stacked 10 high (with canned beer), "I wanted a proven diesel engine for economy and performance. With about double the mileage per gallon of fuel and with complete elimination of overheating, a major expense has been cut...and a constant source of grief and loss of time has been abolished. From our standpoint, the ability of these Deutz engines to lug down as low as 1200 rpm without smoking means a lot, too."



Sam Frontino, manager, Sunset Beverage Co., left; John Richter, firm's owner and Ed Weisenberg, Air Cooled Diesel Sales and Service, Los Angeles—inspect new air-cooled Deutz diesel-engined tractor.



## M/V NEPTUNE

**Puget Sound Tug and Barge Co. Vessel  
Powered by 1280-hp Fairbanks-Morse  
Opposed-Piston Diesel; Equipped for  
Harbor Work and Trans-Pacific Tows**

By DOUGLAS SHEARING

**A**LL-PURPOSE describes the work capability built into the tugboat *Neptune*, latest addition to the fleet of the Puget Sound Tug and Barge Company of Seattle, Washington. Designed by Philip F. Spaulding & Associates and powered by a 1280-hp Fairbanks-Morse opposed-piston marine diesel, this 199 gross ton tug has the power for heavy log and barge towing and the maneuverability for the delicate work of ship assistance; the navigational equipment for in-shore work and the fuel, lube oil and water capacity and the seaworthiness for long tows keeping her at sea for 35 to 40 days; the construction and accommodations for comfortable operation the year round and in cold Alaskan waters.

One hundred feet in over-all length with a 27.2 ft beam and 13.6 ft depth, the *Neptune* was in a sense designed around equipment previously specified by the owners as essential to the "all-purpose" performance expected of her. For example, to provide a 45,000-gal. fuel capacity for trans-Pacific hauls, wing tanks were specified. Coupled with a double bottom, these tanks give her, in effect a double hull. The safety factor is further increased by a concrete-filled steel guard. The hull itself is all welded steel, 3/4-in. thick below the waterline

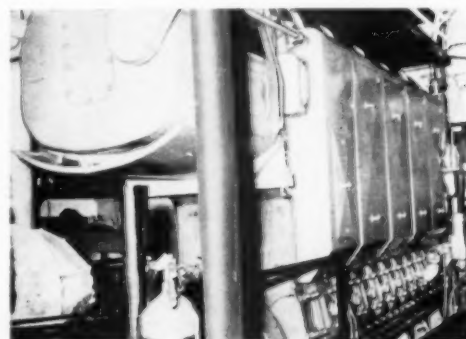
and 7/16-in. thick above. An unusual feature of this tug's design is a stern transom in place of a counter. This was done to decrease vibration and propeller cavitation. Throughout—both in design and in equipment—the emphasis was on maximum power and easy maneuverability.

The compactness of design of the 1280-hp Fairbanks-Morse Model 38D8 1/4 O-P marine diesel affords important advantages to a tug like the *Neptune* that must have space in the engine-room for considerable auxiliary equipment to make her a sea-going and all-weather vessel, and maximum space throughout for the comfort and efficiency of her crew. The engine delivers its power through a 3:1 Western Gear Corp. Sea-Master reduction gear to the manganese bronze propeller manufactured by Coolidge Propeller Co. A larger-than-usual propeller—102 in. in diameter by 64-in. pitch—was specified to insure optimum maneuverability. The rudder, too, is over-size for the same reason. Translating this tug power into tow power is a Markey-type TES electric winch. This towing winch has a drum capacity of 1,800 ft of 1 3/4-in. wire rope and a line pull capacity of 20,000 pounds. Other working equipment includes a 7-in. Columbian nylon hawser with over 80,000 lbs test pull.

The work capacity of the *Neptune* was given its first real test towing a barge loaded with 9,200 barrels of fuel oil from Seattle north to Bellingham, Washington. On this trip she averaged 8.8 knots. On her initial trip home from the Gunderson Bros. Engineering Corp. shipyards at Portland, Oregon, not under tow, she averaged between 12.6 and 13 knots. As might be expected, the *Neptune* is replete with navigational equipment for every service from harbor work to a 4,536 mile tow to Japan. Much of this equipment was supplied by the Northwest Instrument Co. There is a 120-fathom Fathometer Junior depth sounder manufactured by Raytheon, a Bludworth Standard Arrow direction finder, a 7-in. Atlas Underlite compass, a 75-watt output Northern Radio Co. radio-telephone and an RCA radar with a minimum range of 50 yards and a maximum range of 32 miles. Steering is made easier by a Sperry 2-hp electro-mechanical system with a crab clutch for easy switch-over to manual control.

Two 60-kw generator sets power the 120- and 240-volt systems for the tug's electrical needs. Compressed air is supplied by two Quincy D-340 compressors driven by 10-hp motors. One, driven by a 230-volt motor, is used to start the Fairbanks-Morse propulsion engine; the other, driven by a 115-volt motor, is used for the Cunningham whistle, sea chest and work bench tools. Other engine room equipment includes a 2-in. Fairbanks-Morse fire pump and an F-M general service pump. The tug's Deming bilge pump has a discharge rate of 100 gal. per minute at a 20-ft head and a capacity of 85 gallons per minute at a 50 foot head. Special provision was made to insure that the quarters for the *Neptune's* crew of ten would be warm regardless of the cold by insulating all weather decks and bulkheads with from three to four inches of spun glass. Other creature-comforts, particularly important on extended tows, include a Way-Wolff ship heater putting out 157,000 btu's and featuring complete thermostatic control in each room. The heater also provides ample hot water for the galley and showers. The galley is equipped with an Olympic marine range, electric refrigerator and two electric deep freezers. Construction of the tug was supervised for the owners by McGinitie & McDonald, Seattle marine surveyors and consulting engineers. The Puget Sound Tug and Barge Company with its fleet of 10 tugs, has in the *Neptune* a tug that can round out its operations by doing anything and everything.

**The 1280-hp Fairbanks-Morse Model 38D8 1/4 O-P marine diesel on the *Neptune* delivers its power through a 3:1 reduction gear to a larger-than-usual—102 in. in diameter by 64-in. pitch—propeller.**



**DIESEL PROGRESS**

# CLARK'S POWERFUL DOZER

By W. L. BODE

**T**HE Construction Machinery Division of Clark Equipment Company has announced the availability of one of the most powerful production model dozers ever built—its new 600 hp, 104,000 lb working weight Michigan Model 480 rubber-tired unit. The machine recently completed extensive field testing on the Illinois Tollway Project. Nearly 27 ft long, 14 ft wide and 11 ft eight in. high, the Model 480 has a top speed of 28 mph, both forward and reverse. It is powered by a 12-cylinder Cummins Vee type turbo-charged diesel engine. The 52-ton dozer has four 33.5x33-26 ply tires. Clark engineers made a series of tests on the model 480 as it push-loaded various makes and models of scrapers in different soils on the McCarthy-Mass-Dillon Construction Company's sections of the Illinois Tollway Project, near Huntley. Here are some typical average results: Material: Sandy clay. Scraper: 27 cu yd Michigan model 310. Loading Time: 22 seconds (average) with Model 480 pusher. Loading sand up a 3 to 5 per cent grade took less than a minute with the 480 push-loading. Actually, with the model 480 push-loading, material boiled over the sides of the pan in 13 seconds in most materials.

There are many reasons for the model 480's fast-loading ability. One, of course, is its 600 hp engine. Another is its Clark torque converter drive. The torque converter automatically matches the 480's power output to loading demands. Once the dozer blade is against the scraper's push block, it stays there. If the scraper starts to bog down, the dozer automatically delivers more push. If the scraper tries to run away from the dozer in easy going, the torque converter automatically matches the 480's power output to the increased speed. With no thump-thump on the push block, no stalling or lugging, no scraper running away from pusher, there are no wasted seconds in the loading cycle. And as the scraper raises its pan to pull out of the cut, the torque converter supplies an extra boost for clean, fast getaways. The model 480 Tractor Dozer has been engineered for heavy-duty push-loading, road building and land clearing. It tackles tough dozing and grading jobs, and it's a workhorse in sand and gravel pits.

Model 480's modern four-speed power-shift transmission and torque converter drive makes it easy to handle. No special operator is required. Without foot-clutching, the operator simply moves easy-throw levers to change speed or direction.

The operator sits well-forward and has a good view of the dozer blade and excellent all-around visibility. Model 480's high stability and big tires

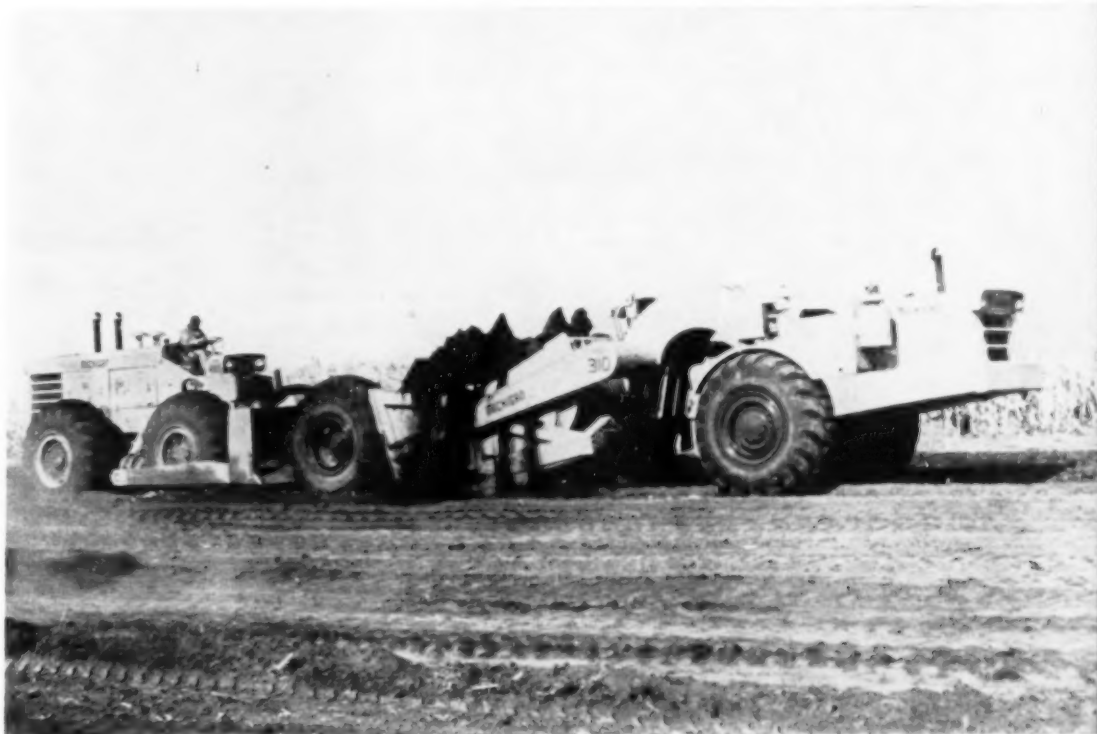


New Clark model 480 rubber tired bulldozer equipped with a Cummins 600 hp vee-type diesel to make it one of the most powerful earthmoving machines ever built.

give the operator a smooth ride at any speed, forward or reverse. The model 480 is an extension of the Michigan line of construction equipment into the 400 series, all 600-hp machines. It has all the features of the 180, 280 and 380 dozers—all wheel drive, four-speed power-shift transmission, torque converter, power steering and planetary-wheel axles. The dozer blade pivots forward and back,

tilts side to side, rises up and down— all movements handled hydraulically from the operator's seat. The blade is reinforced with heavy steel plate for push-loading. All wheels and tires are identical and interchangeable. Oscillating axle and no-spin differential make sure all wheels are in contact with the ground with power going to the wheels with the best footing.

The model 480 dozer pushloading a model 310 Clark 27 cu yd scraper. This dozer features Clark's own torque converter drive as standard equipment.



# DIESELS AROUND THE WORLD

By F. HAL HIGGINS

**T**IMKEN Roller Bearing Co. reports its fleet of 35 vehicles and 42 drivers won a first place in the National Fleet Safety Contest in travelling 1,003,713 miles without an accident. A big Mack tractor and trailer with 18 wheels illustrates the Timken announcement, but what make of diesel engine is under the hood is kept a company secret.

Rollers for road, street, dam and other earth-compacting construction jobs are going more and more to diesels. For eight different makes with 66 models in steel rollers, 52 models are offered in diesels. Only the smaller sizes not seen much in modern road construction are still in gas engine power.

Australia has a new diesel powered 4-wheel drive tractor called the Holder, manufactured by the Queens Bridge Motor & Engineering Co. Pty. Ltd. Engine is single cylinder 2-stroke.

Chamberlain's 45 hp diesel tractor recently covered 11,140 miles in 19 days in the Mobilgas rally in Australia for what is claimed is a world's record for a tractor run.

The German Porsche diesel tractor is announced for the U.S. trade in a full page in *Farm Implement News*. Porsche Diesel Importers, Inc., Milford, Conn. is the American set-up that is now seeking dealers throughout the U.S. and Canada. The Porsche is air cooled and has speed ranges from 1.6 to 16 miles per hour with an optional crawler gear that permits a speed as low as .82 mph. One of these Porsche diesels was in the international plowing match at Peebles, Ohio.

Eimco at Salt Lake City announces it is making the Allison torquatic converter standard for its new 105 Tractor-Dozer. Three years ago your Old Reporter visited the Eimco plant at Salt Lake City and was greatly impressed with its GM and Cummins-powered underground mining tractors that were being shipped all over the world. Since then he has seen them on jobs in the Sacramento Valley on some of the great P.G. & E. dam and power jobs.

The Daimler Company Limited, Coventry, England, is now ready with a line of diesel engines aimed at American demands in truck, tractor, bus and marine equipment. The Daimler has a great background of powering those double deck buses in Europe. The Daimler diesels are ready in both vertical and horizontal models. C.A.V. or Simms injection pumps are standard.

Yugoslavia has recently ordered 1,000 Perkins diesel-powered Massey-Harris-Ferguson tractors. In addition, the Tito nation is taking 600 Perkins diesel engines for the Yugoslav Zadruger tractor. There will be some 12,000 Perkins diesels in that country by end of 1957, say the Perkins folks.



Something is being added to U.S. diesel tractor farming in the trend to foreign diesels. Here is the Volvo that appeared at the recent International Plowing Matches in Ohio. The auto of same name has quickly found a place in U.S. foreign car sales. Certainly with German, British, French, Italian, Swedish diesel tractors down to the small sizes in diesels, they are bound to influence that trend in the U.S. as our gas prices keep rising.



Cane Rake on a TD-18 International diesel operating in Hawaiian Cane.

The German-built "Uni-Mog", scheduled for the Nebraska Test at University of Nebraska this year, shown here with the new Danuser post Hole digger in big size for telephone, power and light poles, etc. The "Uni-Mog" is a Mercedes-Benz diesel and is expected to find a ready U.S. market.



Spreckels Sugar Co. recently celebrated its 60th anniversary with a special issue of the Spreckels Sugar News to record the event. The company has led the world in mechanizing the production end of sugar beet farming from the horse days up through the steam cable Fowlers, to crawler tractors in first gas and then diesel. Big Cummins-powered Peterbilt trucks handle their liquid sugar in tankers. Practically all California sugar beets are diesel tractor grown from plowing to harvest—Allis-Chalmers, Caterpillar, International, Oliver, Case, Ford, Deere—and some irrigation pumping is done with stationary Waukeshas, Hercules, GM's, Continentals, as well as some of the kinds mentioned in the tractors.

Denmark, France, Ireland, Sweden, England, Belgium, Scotland and Holland sent their latest models of sugar beet harvesters to a public demonstration in England last October. The continental machines are designed to save the valuable beet tops for live stock feeding in areas where the average beet field may be only two acres or so. But all 20 machines were pulled by diesel tractors.

German, Dutch, Danish and British potato harvesters demonstrated before the British Potato Board early last October. Some 4,000 attended over the two days. Observers noted too many men on the sorting tables and operating the tractors for the economic trend of the times. Also, some machines left too many potatoes in the ground. But "complete harvesters" are on their way to meet the growing labor crisis, think the British officials. All machines were powered by diesel tractors.

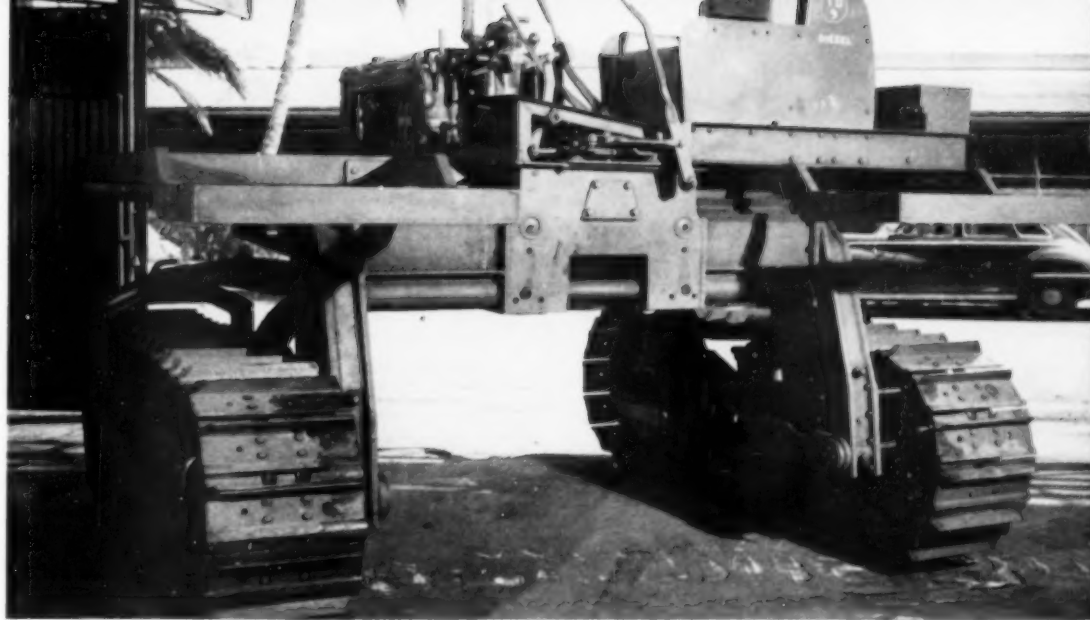
The big International Plowing Match at Simco, Ontario, Canada, last Oct., brought out fine exhibits by manufacturers of diesel tractors. Allis-Chalmers showed its new D-17, a 5-plow tractor. Mercedes-Benz came in with a diesel truck. David Brown showed its 900 tractor, and International brought its B-250 diesel. Rainy weather cut the expected 100,000 attendance but this is still Canada's second biggest show.

A pair of International TC 6 crawler tractors recently completed 17,000 hours of operation in the Scottish Agricultural Industries, Ltd. at their fertilizer works. They have been spreading granulated fertilizer in eight large storage bins. Overhead lifting tackle move the tractors from bin to bin. Bought in 1950, these diesel crawlers have had maintenance overhaul every twelve months and have given no trouble, report the owners.

Delegates from 28 different countries recently attended Caterpillar's World Dealers' Conference at the company's Desford, Leicester, England, plant. This is the first such conference outside the U.S. for the Peoria firm.

Southern France's vineyards have recently received 200 of Ransomes, Sims & Jeffries MG6 crawler tractors, 80 of these machines being fitted with diesel engines. These hilly vineyards are steadily trending to diesels.

F. Perkins, Ltd. recently sent a mobile service school to the Argentine for promotion of its line of diesel tractors. The Dodge trucks used in this mobile school, are powered with Perkins diesel



Hi-Wide TD9 adapted for operation in Hawaii by Stubenberg Company, the very successful I-H dealer in the Islands.

engines. Four self-contained removable Perkins engines are carried for the school work for manufacturers, distributors and dealers visited.

International Harvester Co. of Great Britain is enjoying its biggest export boom since tractor production started at its Doncaster works in 1949. In the Pacific, South American, Far East and Australian areas business is double last year's. In the Canadian areas it is 1,300 percent ahead. Advance orders and estimates point to another record year in 1958.

Iran was the setting for a recent demonstration by International's distributor for that country. A parade of tractors and equipment through Teheran's streets followed by demonstrations of disking, plowing, shovel loading, post hole digging, etc., before farmers and Government officials.

India is getting specialized treatment by International Harvester Co. for the sugar cane fields, a special high-clearance version of the British-made Farmall Super BMD tractor modified by Voltas. Spraying and fertilizing attachments were mounted on the tractors to meet the peculiar demands of Indian cane farming.

The Drott earthmoving bulldozer and loader mounted on an International TD 6 was recently demonstrated to a group of 400 contractors and government officials at Helel Hemstead New Town, England, by British International construction equipment engineers recently organized. The IH men announced that their TD18 of 124 hp will be built at their British factory next year when a capacity of 3,000 tracklayers will be ready to supply the demands.

Danuser all-purpose blade mounted on Ford Major diesel tractor. It is designed to put most wheel tractors into more industrial jobs around home and city building, landscaping and such work. Manufactured by Danuser Machine Co., Fulton, Mo.



# SKY HIGH DIESELS WORKING FOR SCIENCE

By WARREN W. FLAGG

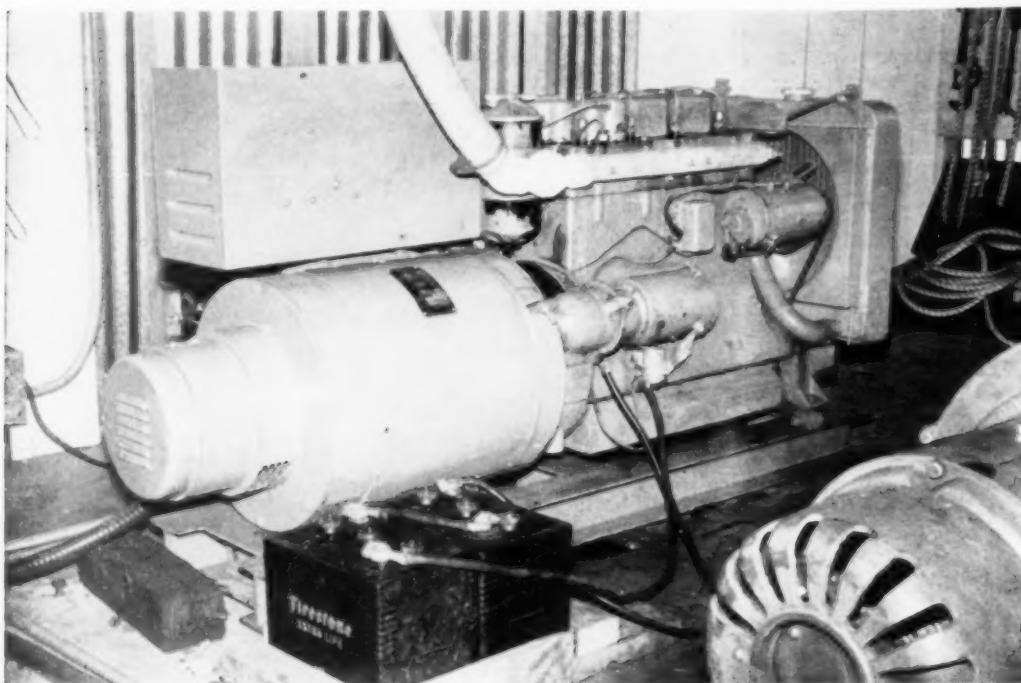
**D**ID you ever climb a mountain over two miles high? If you did, then you have some idea of what it might be like to live and work at such an altitude where the stars seem close enough to touch and the Milky Way as close as that cob web in the corner near the ceiling. This is the International Geophysical Year. Around the world scientists of many countries are busy at work, pooling their knowledge and findings to help provide a key to fit the lock on the door to the future. High above the blue Pacific on one of the world's great mountains such a group of dedicated men are hard at work in almost pure isolation and to help them, dependable diesel engines are making their contribution to this Geophysical Year.

Ask the average man about Hawaii and he'll picture blue ocean, gleaming white and black sand

ning about three years ago it has seen outstanding studies made of the water vapor content of Mars and Venus. Background research into the droplet formation of clouds and the formation of free ice crystals in the atmosphere. Now the researchers are studying the carbon dioxide content of the air, ozone studies, and the amount of natural radiation received from outer space and the important factor of how much natural radiation our own earth emits. The observatory has been accurately located at an elevation of 11,146.05 ft above mean sea level. The diesel generator sets that provide the current to run the intricate recording instruments, to furnish light and other comforts to the staff, and even run the TV set are probably among the highest permanently located diesel sets running on a continuous basis that can be found anywhere. It is here on this great mountain mass in the Paci-

fic that men are hard at work with their feet on the ground while their heads are in the clouds.

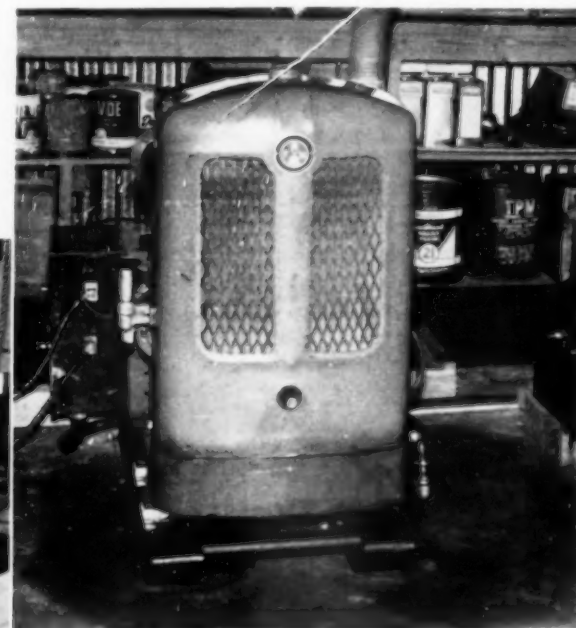
The first diesel powered generators installed were two small Winpower units made by the Winpower Manufacturing Co. of Newton, Iowa. They were the model FR6000AE4, powered by single cylinder Fairbanks-Morse model 45B4 $\frac{1}{4}$  engines rated at 10 hp at 1800 rpm. The generators produced 6 kw of pow-



General view of Kato unit, rated 10 kw at 1800 rpm. ➤

beaches, soft music, swaying palm trees, and hula girls, and hula girls and hula girls. Yet above all these attractions that bring tourists to Hawaii, rise the slopes of Mauna Kea and Mauna Loa reaching almost 14,000 ft into the blue Hawaiian sky. On the slopes of Mauna Loa where they are high above any man made impurities or natural dust in the atmosphere, complex scientific instruments are at work around the clock and they get their electric power from diesel generator sets. The Mauna Loa slope observatory was built as a joint function of the U.S. Weather Bureau and the National Bureau of Standards. Since its small begin-

Mauna Loa observatory, located at an altitude of 11,146 feet looks across broad "saddle" to even higher 13,865 foot Mauna Kea. ➤

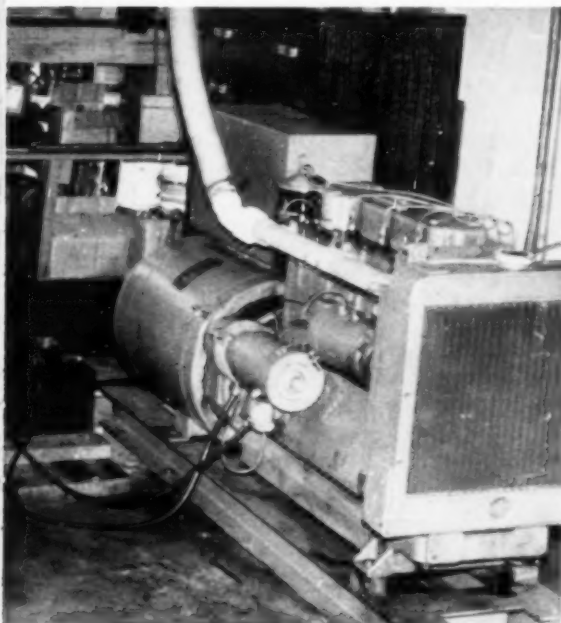


Generator "shack" at Mauna Loa observatory. F-M powered Winpower generator is on left, F-M powered Kato 10 kw set on right. ➤



Korfund model AK-40 vibration isolators installed beneath Winpower generator set powered with Fairbanks-Morse model 45B4½ engine.

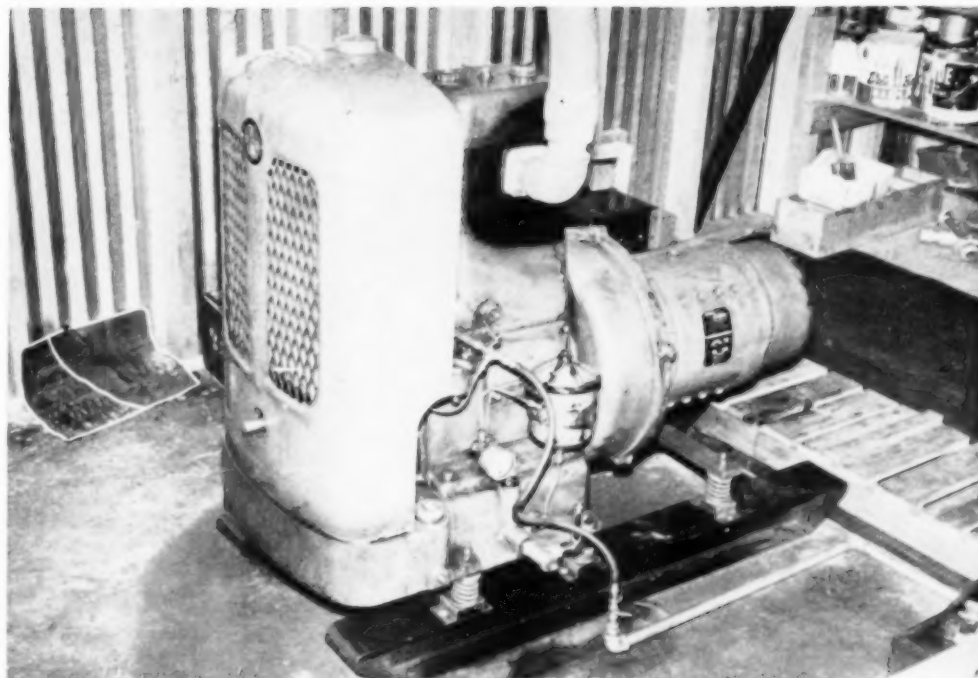
er, 115/230 volts, 60 cycle. At the high altitude with the great drop in atmospheric pressure it was necessary to install Chevron cold starting aids using the ether capsule type of starting fluid for injection into the manifold. Also to provide a ram air effect, the regular air cleaner was removed, the inlet rotated 90 degrees and a scoop fashioned from sheet metal fastened to it to take air from the back of the fan to improve engine breathing. To help control the inherent vibration of a single cylinder engine, six Korfund vibro-isolators were installed between the engine generator combina-



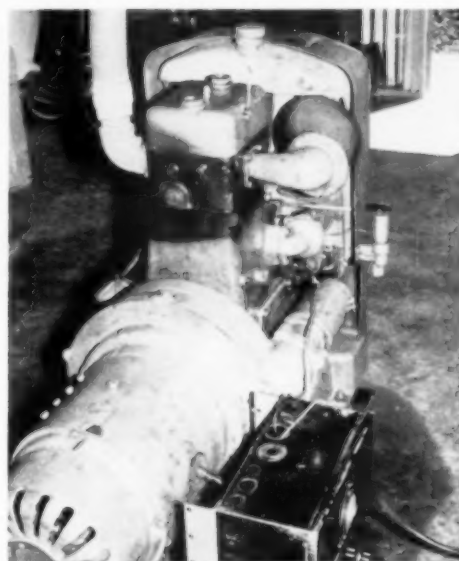
tion and the base as shown in the photograph at top of page.

As the observatory's functions expanded, its need for more power grew and a 10 kw generator was secured. The original Winpower units then became standby sets. The new generator was produced by the Kato Engineering Co. of Mankato, Minn. and is the model 49MGS4. It is rated 10 kw, 125 kva, 120/240 volts, 60 cycle. It is driven by a Fairbanks-Morse 4 cylinder model FM8AG-3½ running at 1800 rpm. The addition of a cold starting aid was also necessary. All units are liquid cooled and ethylene glycol type of permanent anti-freeze is used in all engines. Because of its extremely remote location, maintenance is a serious problem. The scientists on duty have become quite capable of doing trouble shooting and making minor repairs. Their only link with help is by radio telephone to their base of operations at the Weather Bureau at Hilo Airport over 40 miles away. That 40 miles doesn't sound like much but it is across some of the most desolate lava wastes to be found anywhere. What is jokingly called a

All wheel drive vehicles such as these are needed to reach observatory over road bulldozed out of huge lava wastes on volcanic Mauna Loa.



Note installation of cold starting aid and modification to air manifold to provide "ram effect" on single cylinder unit.



road leads up the slopes to the observatory but all wheel drive vehicles of the Jeep or Dodge power wagon types are almost a must for transportation of men, machinery and supplies.

The observatory is still growing and it will play an even more important part in scientific research as time passes. To meet its growing needs for ever more dependable power, plans are now being made to go to a large heavy duty diesel generator of at least 40 kw capacity. It is hoped that budgetary problems will be solved to provide funds for such a set. If some diesel engine manufacturer really wanted to run high altitude research testing, here would be the place to do it. They would thus get their testing for their product and materially help in continuing the pure research that is so important and necessary in this new age of space. How about it gentlemen of the diesel industry?



# MILLIONS FOR MISSOURI ROADS

By L. H. HOUCK

**M**ISSOURI topped the \$100 million mark for roads in 1957 for the first time in history with a total of \$102,649,481 spent or obligated for modernizations, constructions and improvements on 4,581 miles of road. Interstate system routes drew the greatest amount of the commitments, \$50,973,795, and it should be remembered that Missouri was the first state to complete a section of interstate highway in two categories—grading and paving. Construction in 1958 is expected to equal or top the record figure and the national lead in completing interstate routes is expected to be maintained. History is being made in Missouri by its rapid advancement of the interstate highway system and if diesel had not already carved out its own niche in the hall of fame where brute power and plenty of it is required, then it would now have to be invented to carry out the tremendous highway program. As it is, new power must be found for the 1958 season and contractors with projects underway are stiffening up production schedules with more powerful diesels and new equipment.

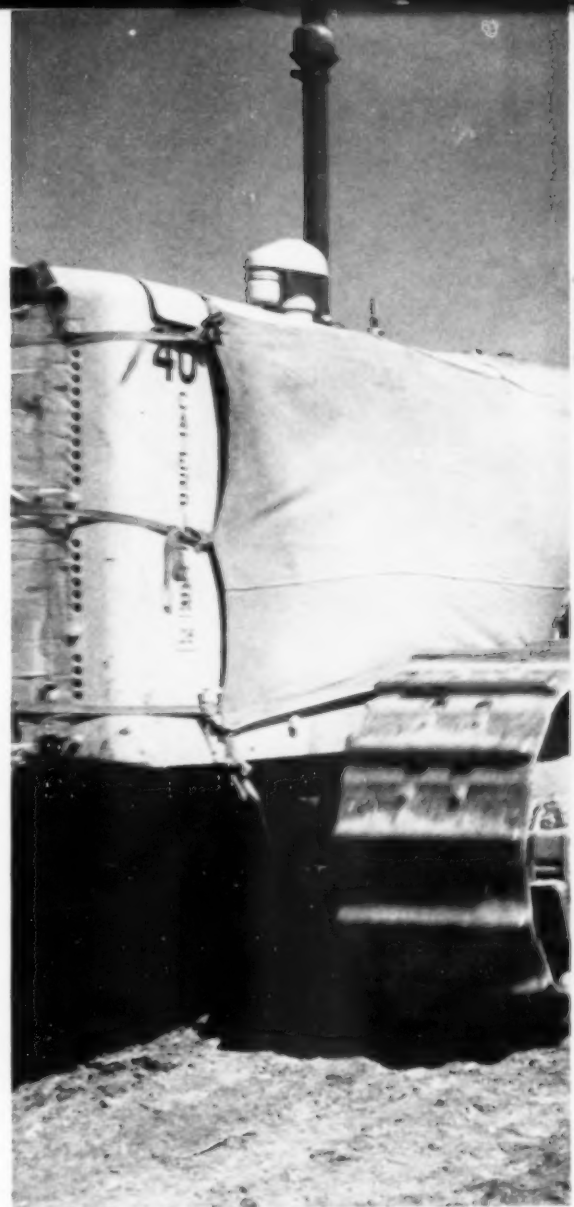
In St. Louis alone, the expressway system which has to be developed to handle the local traffic and keep the interstate highway system traffic out of their hair, will spend or obligate \$20 million by July, which will make \$80 million spent on highway improvements there since the program got underway in 1950. At a recent meeting of 500 heavy construction contractors of the Heavy Constructors Association in Kansas City, Lee Morgan, a member of the governing council of the Caterpillar Tractor Co., Peoria, Ill., said national construction in 1958 will total \$49.6 billion, or 5 per

cent over the 1957 figure. He said he based his prediction on a conservative estimate made by the U.S. Department of Commerce. To illustrate the size of the job ahead in two states he said only 22 miles of 803 interstate route miles in Kansas have been completed and only 27½ miles in Missouri's 1,095 interstate miles have been completed.

In 1958 the completed interstate mileage in Missouri will go up sharply when several new bridges are completed, such as the new bridge over the Missouri River near Boonville. Massman Construction Co., Kansas City, recently completed three river piers in a \$1,189,954 contract, on an entirely new section of interstate highway 70. Maxwell Bridge Co. will grade and erect approach substructures under a \$747,771 contract and Stupp Bros. Bridge & Iron Co. will erect bridge superstructure under a \$1,446,929 contract. Interstate 70 follows present U.S. 40 except where it has been relocated to conform to new interstate specifications. As a result U.S. 40 is being relocated at Columbia by Clarkson Construction Co. under a \$3,106,192 contract. Both of these projects will probably be completed when the 1958 construction season closes. The Missouri Highway Commission announced recently that a new limited-access highway would be built to handle traffic through St. Louis—the fourth radial expressway planned or under construction between St. Louis county areas and downtown St. Louis. This will be eventually designated as Interstate 44 and will be 12 miles long, the Commission said.

Diesel-wise such a gigantic construction program means much to manufacturers of diesel powered

Clarkson Construction Co., used a fleet of Allis-Chalmers HD-20's on it's relocation job at Columbia, Mo.



Dirt moving on interstate route south of Lebanon, Mo., with D8 Caterpillar Tractor and scraper.

equipment, diesel engines and parts suppliers. But that is only part of the diesel story. Walter F. Mulady, Chicago trucking executive and former president of the American Trucking Assn., said recently that highways now under construction will enable the trucking industry to provide a more efficient and economical service to every segment of the industry and that the trucking industry could anticipate an increase in overall tonnage of at least 10 per cent. Increasing tonnage, moving faster over interstate highways, mean bigger engines and bigger trailers or more units. Since most units are now operating at legal limits, then the potential market for new diesel powered tractors and high-cube trailers looms up beyond the normal demand. Highway construction figures alone are expected to reach \$5.5 billion in 1958 or 14 per cent above the record breaking 1957. Manpower will be a problem, too. International Harvester is training mechanics, most other large manufacturers are interested in training operators of heavy equipment as well as mechanics, and one of the only institutions of higher education in the U.S. to offer courses in diesel engine service and in operation of heavy construction diesel-powered equipment—the Texas A. & M. College—completed its first year in May with a record enrollment.





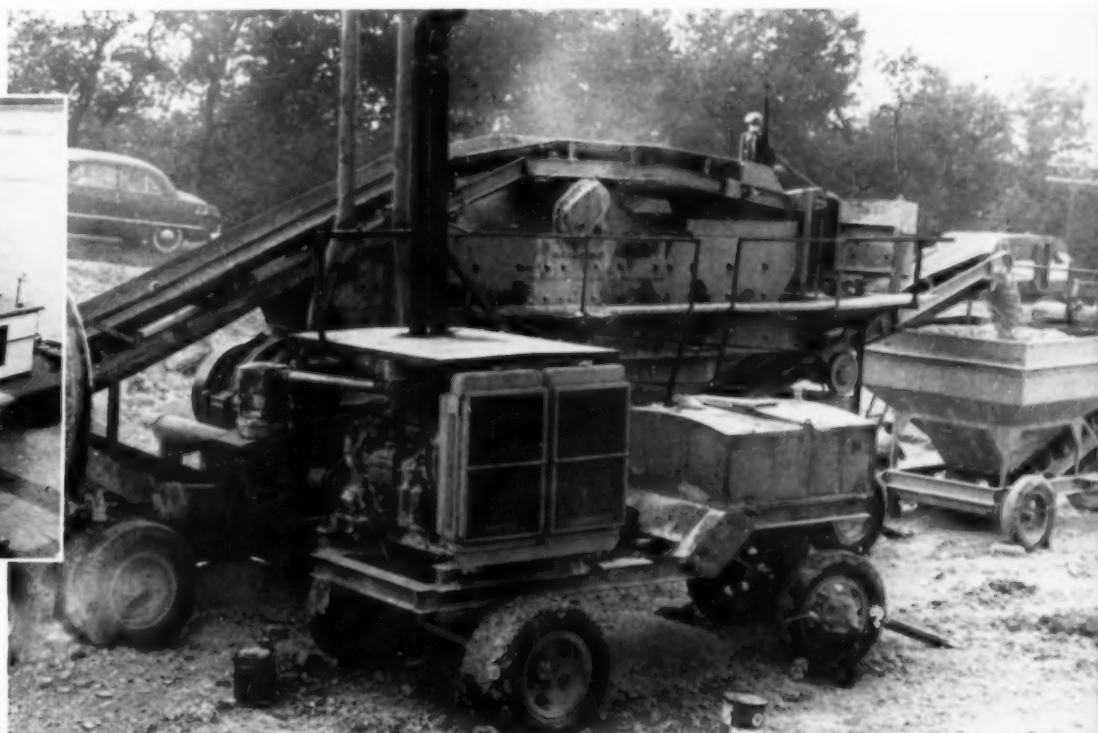
▲ **AFTER**—After the underpass and highway has been modernized and built to interstate 44 specifications. Location is in the Lebanon area where the first section of interstate highway in the U.S. was completed.



▲ **BEFORE**—This is an underpass on what is now completed section of new Interstate 44. See what new four lane highways mean to auto and truck traffic in the "after" picture above.

Even river boats are used to build roads. Massman Construction Co. used its diesel towboat *John Thomas* for towing concrete barges on the three river piers near Boonville. It is powered with a Cat D-13000 diesel. The air barge not shown and used to supply air for the caisson work used four Gardner-Denver 600 cfm air compressors powered with two 6-71 GM diesels and two Caterpillar D-13000 diesels. A pair of 8 in. centrifugal pumps were powered with two 4-71 GM diesels.

Pair of GM 6-71 diesels twinned through an Allison torque converter drive Cedar Rapids secondary unit of the rock crushing plant of Reno Construction Co., on U.S. 54 in Camden county. Rock was used for sub-base and found in one of the cuts. Note the ubiquitous "Texaco" lube oil in foreground.





## WHAT'S GOING ON IN ENGLAND

CONDUCTED BY BERNARD W. LANSDOWNE

Bernard W. Lansdowne is an associate member of the Institution of Mechanical Engineers and is widely known among British and European diesel manufacturers as a former editor of our English contemporary "Gas & Oil Power." His early workshop training was spread over seven years with A.E.C. Ltd., Southall, following which he served some five years with that company's sales engineering department. He is now specializing in industrial advertising with Roles & Parker, Ltd. in London.

### Blackstone Twin Bank Engines

**T**HE range of Blackstone diesel engines built at Stamford in England comprised, until recently, two 8 cylinder designs giving a maximum output of 600 bhp from the largest single unit. This power range has now been more than doubled by the introduction of a series of Twin Bank engines in 12 and 16 cylinder sizes, either turbo-charged or normally aspirated, thus enabling high-power engine performance to be obtained with the use of small standard cylinder components. The development of the twin bank series has been based throughout on a complete interchangeability of main working parts with the Blackstone EV/ER series of engines already established throughout the world. No design problems regarding combustion or working systems have therefore been encountered, and attention has been concentrated on producing a reliable, versatile engine unit for industrial, marine and rail traction applications.

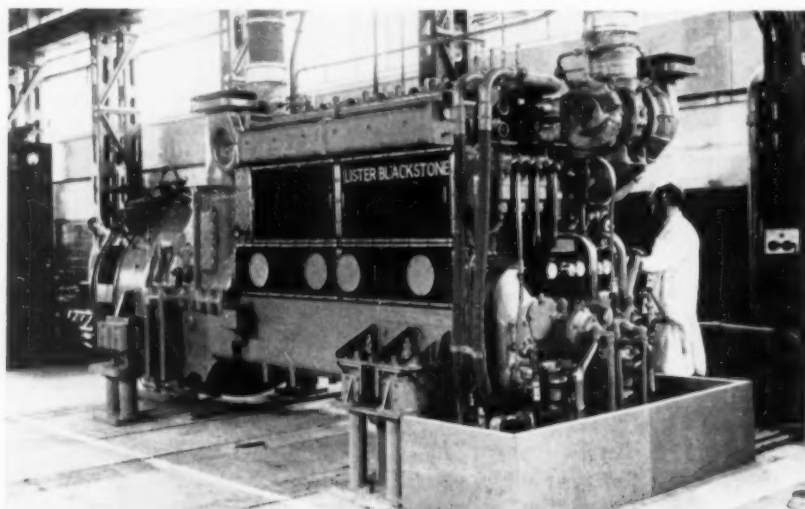
For nominal crankshaft speeds up to 600 rpm the twin bank engines are designated EV12 and EV16, while for crankshaft speeds over 600 rpm the new units are known as ER12 or ER16. Cast iron pistons are used for the lower speeds and aluminum-silicon alloy pistons for the higher. The two verti-

cal banks of cylinders with  $8\frac{3}{4}$  in. bore by  $11\frac{1}{2}$  in. stroke are bolted "back to back" to each other and also to the common engine base which carries both crankshafts in steel-backed white metal lined bearing shells. Each bank may be considered to be an individual engine unit complete with its own governor, running gear, oil and water pumps, the common output drive being taken through a gearbox built-in to the flywheel end of the engine. A hydraulic damper is fitted at the forward (free) end of each crankshaft and a flywheel of the largest practicable proportions at the drive end. An essential feature of the twin bank drive is that between each flywheel and input gear to the gearbox is interposed a Blackstone nodal damper coupling of patent construction, which provides both flexibility and also a high degree of viscous damping.

A gearbox built-in to the flywheel end of the engine is a completely self-contained unit transmitting power through straight spur gearing from the two individual banks to a common output shaft. The lower half of the box is formed in the engine base and the upper half is enclosed by separate removable covers. A feature of the gearbox is that pinions and gearwheels have been de-

signed to be interchangeable so that both speed increase and reduction ratios may be obtained using standard gears at a fixed center distance. With a ratio range of 1:1.57 to 1:0.71, this means that for industrial applications the output shaft speed can be tailored to suit the customer's requirements for all speeds between 1200 rpm and 425 rpm. For main propulsion duties reduction ratios up to 3:1 are available. Twin bank engines are normally cooled using fresh and raw water systems with one heat exchanger and oil cooler per bank, and a further oil cooler for the gearbox lubricant. Radiator cooling is available as an alternative, with the fan either motor driven or powered from a forward extension shaft to one of the engine crankshafts.

It is possible that an industrial or traction twin bank engine may be required to operate for extended periods on low load, in which case the duplication of working systems permits more economical running to be obtained by closing one bank down completely as a temporary measure. This can readily be carried out by disconnecting the drive of the bank to be isolated at the input coupling to the gearbox. This, incidentally, also enables half-power to be developed in an emergency should a fault develop in one bank which would otherwise necessitate the complete engine being closed down. For main propulsion duties it is often impracticable to have the main engine inoperative while such a conversion is being carried out; an additional clutching arrangement is therefore available for such engines which will enable either bank to be instantly isolated should this be required. Twin bank engines designed for single bank operation are fitted with a duplex governor system so that each bank is under the control of its own governor. Balanced governor response and equal sharing of load between banks is ensured by the hydraulic feed to both governors being controlled by a single pilot valve; also, the two governor outputs contribute movement to a common floating linkage, the mean deflection of which is used to control the fuel pump racks of both banks of cylinders.



# DIESEL OFFSHORE DRILLING TENDER

**One of the Most Powerful Drilling Tenders to Operate in the Gulf of Mexico Was Introduced to the Off-Shore Drilling Industry in Beaumont, Texas, when the 3150 dwt. Ton *Howard S. Cole, Jr.* Was Commissioned by Coastal-Marine Drilling & Construction Corporation, of Houston.**

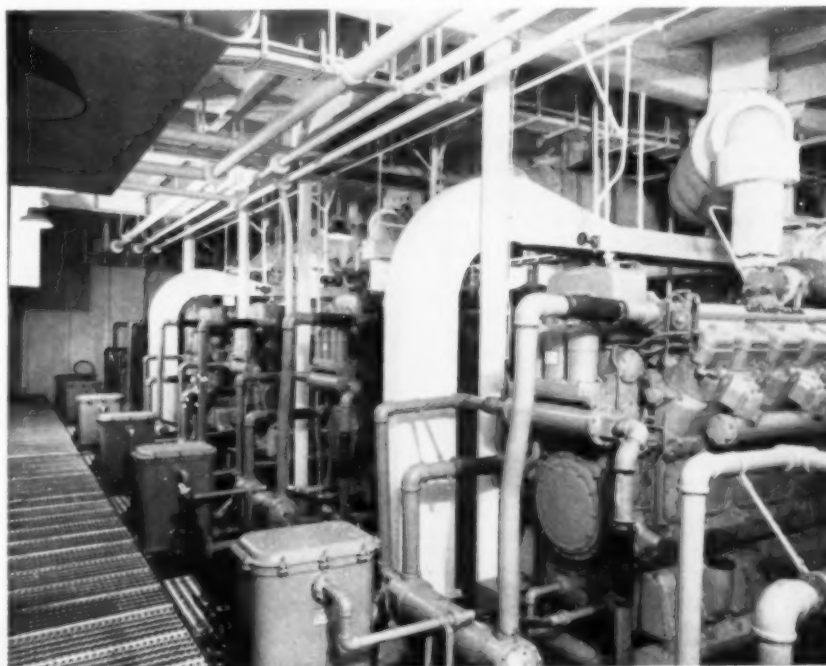
**A** NEW type of offshore oil drilling platform tender having the mobility and seaworthiness of a conventional ship even during a hurricane was commissioned by the Coastal Marine Drilling and Construction Corporation recently. Ceremonies were held at the Ideco plant and at the Port of Beaumont. The new craft, which unlike its predecessors needs no tugboat help in rough weather, was built by New York Shipbuilding Corp., Camden, N. J. and equipped for drilling by Ideco, Inc., one of the Dresser Industries of Dallas. It has been christened the *Howard S. Cole, Jr.* Most significant difference in the new tender is a dual-purpose diesel-electric power plant, developed by the General Electric's Locomotive & Car Equipment department and Caterpillar Tractor Company, which makes full power available for both drilling and ship propulsion. This system eliminates need for additional propulsion machinery and valuable space it would take up, yet provides a speed of nine knots. It also permits the tender to drill until the last possible minute in the face of an approaching storm before casting off from the platform. A General Electric oil well drilling drive system provides the flexibility necessary to instantly transfer the tender's power from drilling operations to propulsion. In the engine room five Caterpillar D397 turbocharged diesel engines developing 500 continuous horsepower are each connected to a G.E. differential compound drilling generator.

During normal drilling operation this basic power source in varying combinations drives seven General Electric shunt-wound drilling motors. The motors, rated at 625 hp continuously and up to 1000 hp intermittently (for hoisting duty), are located both on the tender and on a permanent drilling platform. The system is controlled from a console on the platform. Upon approach of rough weather the tender can quickly cast off from the platform and get under way. Then the diesel-electric power source is controlled from a console in the wheel house which sends the energy to two General Electric motors which are connected through a Philadelphia Gear Works drive to two propellers. The motors are the same as those used for drilling. The drilling platform will be moved to and from location with a barge. All the major drilling equipment on the platform was manufactured by Ideco, Inc. and has the capacity to drill deeper than 20,000 feet. This includes an Ideco double drum drawworks that was the first drawworks of its capacity designed specifically to accommodate electric power as well as mechanical. The huge main drum of the drawworks is almost five feet long and nearly three feet in diameter. Finger tip air controls are centralized for convenient operation. A third drilling motor powers the Ideco catworks and 27½-inch rotary table.

Another single engine-drilling generator set identical to the five aboard the tender is located on the platform together with an auxiliary mud pump and control panel. When the tender is disconnected, this equipment, operated by a skeleton crew, can perform all drilling operations necessary to sustain the well. In the tender's pumping room, two mud pumps with a combined capacity of 1760 gpm are each driven by two drilling motors. Other equipment includes two mud mixing

pumps, agitators and conveyors. The tender hull is all-welded steel, 272 feet long with a beam of 56 feet and is 22 feet deep. The Texas deck aft forms a 56 by 60-foot helicopter deck. A 60-ton Clyde crane located forward on the main deck will enable the tender to assemble and dismantle a drilling platform without the help of a derrick barge. The crane will also handle all drilling supplies. The craft will operate together with a special 297-ton cargo-supply ship.

Main power source for the *Howard S. Cole, Jr.* is five diesel-driven dc electric sets, consisting of Caterpillar D397 turbocharged diesel engines, driving GE differential compound traction type generators.





# GAS TURBINE PROGRESS

A COMMENTARY BY R. TOM SAWYER

## The Comprex - A New Type of Diesel Supercharger

**A**t the Annual Gas Turbine Conference\* and Exhibition in Washington, D. C., many fine papers were presented. The exhibits ranged from the small gas turbines in the rocket guiding mechanism built by Convair to a large turbine rotor exhibited by Brown Boveri. There was also a large operational exhibit down on the river front which included two small Navy boats with Solar turbines, a GM gas turbine truck, a Curtiss-Wright fire pump, a Boeing generator set and an AiResearch Compressed Air Unit. Of the papers presented the most unusual one was *The Comprex—A New Concept of Diesel Supercharger\*\**. We have long known of the Comprex as a pressure charger for gas turbines, first used by Brown Boveri. In this case Brown Boveri have joined forces with the I-T-E Circuit Breaker Company at the latter's invitation. It was 8 years ago the first Comprex started operating in the laboratories of the I-T-E organization. Since then many uses have been demonstrated. One of the practical applications is that of supercharging a diesel engine. The normal arrangement of the comprex supercharger is shown in Fig. 1. The parts of the comprex are shown in Fig. 2 and its method of operation is shown in Fig. 3 where the air is actually sucked into the comprex and then pushed into the engine under the pressure of the exhaust impulses. An explanation of how it works is as follows: Looking inside the comprex we find four major components: hot stator (left side Fig. 2), rotor, rotor housing, and cold stator. The rotor has a number of (for instance, 35) tubes on a hub. The rotor spins (at about 5000 rpm for an 8 in. diameter and 9 in. length), and each tube is alternately exposed to the two gases (air, exhaust gas) at essentially two pressure levels. It is best if we trace the history of a particular tube through a full cycle, but first a few simple facts. Visualize

a tube full of fresh air connected to a compressed gas tank with a valve in between. When we slam the valve open, things happen fast, but we take two quick looks. We see that a good part of the fresh air has been compressed by a shock wave which has passed through the air. The mixing between the gas and the air which certainly occurs is, however, quite small since the time it takes a wave to travel through a channel is only about  $1\frac{1}{2}$  of a thousandths of a second. The fact that the shock wave travels much faster than the gas particles behind it is essential for the operation of the Comprex. A further experiment demonstrates another typical phase of the cycle. This time take a tube full of compressed gas which is closed off by a valve. When the valve is slammed open an expansion wave travels through the channel. The complete cycle represents a combination of these basic phenomena.

Let us assume air is trapped at approximately ambient pressure in the channel and all valves are closed. We open Valve D (see Fig. 4). Gas entering from the engine exhaust into the channel creates a pressure wave travelling through the channel ahead of the gas-front interface. When the head of the compression wave arrives at Valve B (at this time the gas only partially fills the channel) we open Valve B and let high pressure air enter the engine air manifold. At this time Valve D is already being closed. This generates an expansion wave which decelerates the flow, reducing the channel pressure behind the wave. The closing of Valve D is timed so that the expansion wave created by the closure of Valve D arrives when all the compressed air has been discharged. Valve B is closed at this point. We can now open Valve C, and since the pressure in the channel is still higher than the ambient pressure the gas flowing out creates an expansion wave which travels

through the channel towards Valve A. At the time the entire gas content is in motion we also open Valve A. The moving gas column draws in a fresh charge of air. When the channel is filled we close Valves A and C and repeat the cycle. In the actual Comprex, the opening and closing of the valves is performed by the rotation of the rotor whereby the channels pass over the stator ports. The speed of the rotor, the length of the rotor, and the port locations fulfill the timing requirements. Now we can take the Comprex and follow one of the rotor tubes through a cycle. To this end we will unroll the rotor and stator and let one tube be photographed in its various positions—see Fig. 3. The Comprex requires some special considerations for starting and idling. If driven from the diesel

Fig. 1—Complete Comprex system with controls.

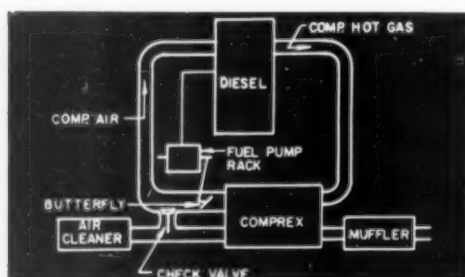
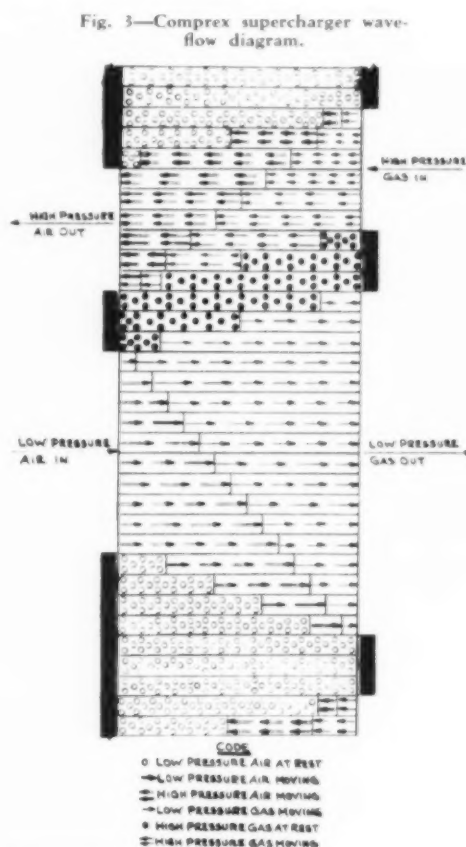
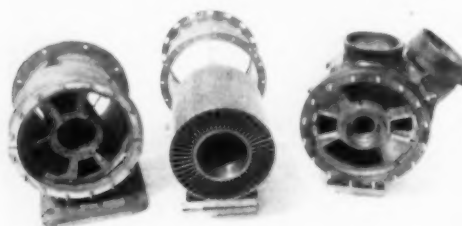


Fig. 2—Comprex components.



\*Sponsored by the Gas Turbine Power Division of ASME, March 2-6, 1958, at Shoreham Hotel.  
\*\*By Max Berchtold, Engineer-in-charge, Comprex Engineering and F. J. Gardiner, Manager, Engineering Products Section, I-T-E Circuit Breaker Company, Philadelphia, Pennsylvania.

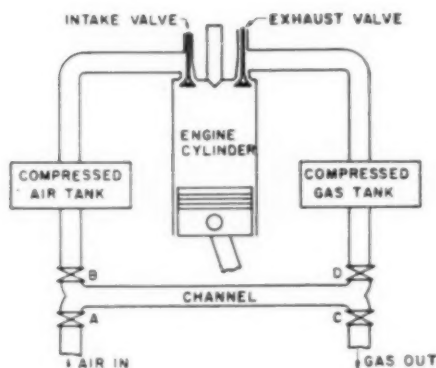


Fig. 4—Simplified sketch.

shaft, the Compress rpm may be so low in starting that the mistiming of the waves becomes intolerable. Furthermore, at idling, the exhaust-gas temperature is too low to supply sufficient air to the engine. As a result of the volume demand of the diesel engine, the air-manifold pressure falls below the exhaust-manifold pressure. Owing to the lack of wave motion the Compress is only partially scavenged and the air admitted to the engine contains some hot exhaust gas which may even cause the engine to stall. This condition becomes critical for exhaust gas temperature below 600° F. To avoid this difficulty it is desirable to admit air to the intake manifold directly and to block off the Compress air-discharge ports. Fig. 1 shows a control system with a butterfly and check valve. Both valves are housed in the cold stator casting, and the necessary passages are contained in the casting. It can be shown that the exhaust-gas temperature is a function of fuel-pump rack position. Thus this rack is a convenient control source. The operation of the butterfly can be made directly by mechanical linkage, by oil or air pressure, or by an electrical circuit controlled by the rack position. The check valve is then self-actuating. As soon as the air-manifold pressure falls below the ambient pressure, air is admitted directly to the diesel-engine intake-air manifold.

There are many combinations which can be used to control the Compress and another method of control uses the pressure differential between the air and exhaust-gas manifolds to actuate the butterfly by means of a spring-loaded membrane whenever the Compress discharge pressure is lower than the exhaust-manifold pressure. Intake throttling of the engine will cause a higher exhaust-gas temperature and will enable the Compress to operate satisfactorily. See cross section of Compress installed on engine in Fig. 5.

#### Several Novel Facts

*First:* The rotor is a rotating valve; it does not add energy to a gas nor does it take any away. Hence just friction must be overcome to drive it. (About

2 hp is needed for a 300 hp engine.) *Second:* The rotor has both hot gas and cold air going through it, and will, therefore, be at a temperature somewhere between these two. Plain steel can be used—no high alloys are needed. *Third:* The speed of the rotor is determined by the time it takes a shock wave to pass through it. If you want to run a rotor slower, just make it longer. (A Compress rotor for a 300 hp engine, for instance, is approximately 9 in. long and runs at 5000 rpm.) *Fourth:* The rotor is very simple with no aerodynamic shapes. The stators are made of cast iron. The cold stator, through which the air flows, remains at low temperatures. If desired, it can be made of cast aluminum. *Fifth:* The best speed for any given condition is given by the velocity of a shock wave, which is approximately the velocity of sound (1120 ft/sec in 60° F air at ambient pressure). The velocity of sound changes only little if pressure and temperature are increased; a large change of load requires only a small speed adjustment. Extensive tests have established the following practical rules for the Compress rpm: *First:* since a large load change can be handled at constant Compress speed, there is no inertia to overcome and the load response is therefore almost instantaneous. See Fig. 6. *Second:* The rotor speed, or timing, is not critical, as one would think at first. The Compress rpm can be changed by as much as 40%, the resultant mistiming reducing the compressed air output. Moreover, this is in agreement with the reduced airflow requirement of the engine at reduced engine rpm. *Third:* Even at quite high pressures the amount of compressed gas leaking through the rotor-stator gap is not severe, and since the shock waves are an efficient means of compressing air the efficiency of the whole unit may be very good. See Fig. 7.

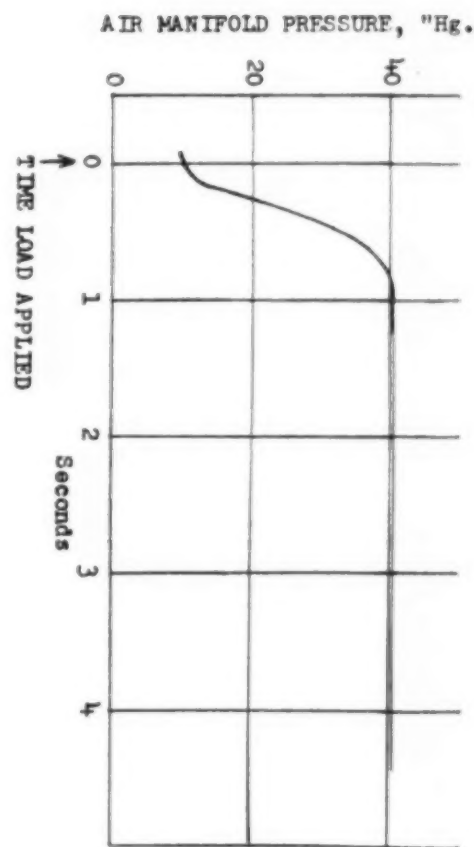


Fig. 6—Rapid response shown in time from low load to full load at constant engine speed.

Fig. 7—Combined Efficiency for 100% and 60% Diesel Engine Speed.

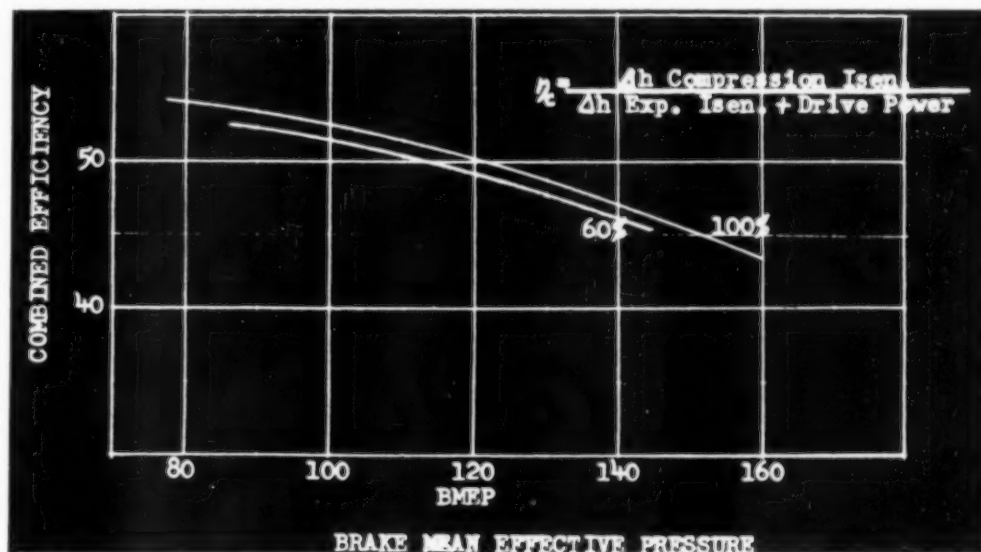
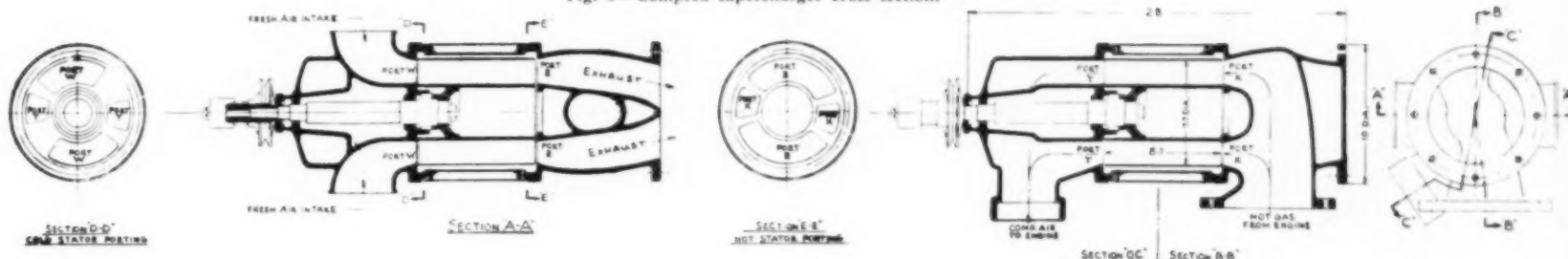


Fig. 5—Compress supercharger cross section.



# DIAMOND T DIESEL USED ON MILK RUN

**T**HERE are milk delivery routes, and there are milk delivery routes. They are by no means all alike, and vary considerably depending on local conditions. Most of them are milk runs in every sense of the word. However, the really rough one that the driver of this Diamond T Tilt-cab diesel tractor takes in his daily stride is an operation that would, to say the least, cause a thoughtful pause by the hardest of early morning bottle rattlers.

Crescent Creamery's job calls for a long ten hour a day stint, including time spent in loading and unloading. During this period the big rig rolls more than 200 miles. Starting out from home base in Reno, the train crosses the Truckee River to climb steadily through the mountains in the east until it reaches the arid, sparsely populated basin of Granite Springs Valley, where jackrabbits and fallouts from the AEC's giant mushrooms far outnumber garage and service stations. Equipment reliability in such a desolate area is a must.

Bulk milk pickups are made from more than a dozen ranches near the City of Fallon until the 3500 gallon insulated, stainless steel tank trailer is filled. Then wholesale deliveries of milk in quart cartons, butter and cream in breakfast-table size containers are dropped off from the refrigerated

16-ft Fruehauf "pup" to retail grocers in town as well as to crossroads general stores. Both types of concerns rely on Crescent, whose motto might well be "the milk must go through." For them it's a 365 day a year proposition, for the daily production of a dairy herd is guided neither by considerations so mundane as holidays or weather, nor those 'way out of this world such as flying phenomena currently flitting through the skies. And there remains the fact that people continue to eat, day in and day out.

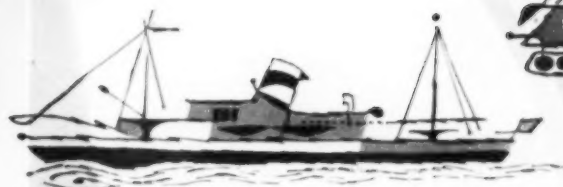
Equipment for this milk route differs considerably from the familiar door-to-door step in type gasoline unit, for the gross combination weight of Crescent's diesel train is in excess of 70,000 lbs. Even so, the Diamond T diesel consistently averages 5.8 miles to the gallon of fuel, even with all of the necessary stops and starts. Average altitude of the run is in the neighborhood of 4500 ft.

Fuel economy and a greater payload are made possible by Diamond T's light weight construction. The sturdy but light manganese-alloy frame has aluminum crossmembers, fuel tanks are aluminum, the large, roomy, driver-engineered cab is constructed of aluminum. These and other features make possible the tilt-cab's light chassis weight.

Crescent Creamery are quite pleased with their new Diamond T. William Foracker, the manager, said, "This Diamond T tractor is just what we need. It has the power to handle our heaviest loads, plus having the necessary sturdiness and strength to keep going day in and day out without an undue amount of preventive maintenance work. We're able to keep it rolling every day in the week, right on schedule, for the Diamond T tilt-cab greatly facilitates periodic inspections. My mechanics tell me they've never worked on a truck with such accessibility of all components—that means a lot to us, in time and money." Among the top quality components built into Crescent's Diamond T diesel are:

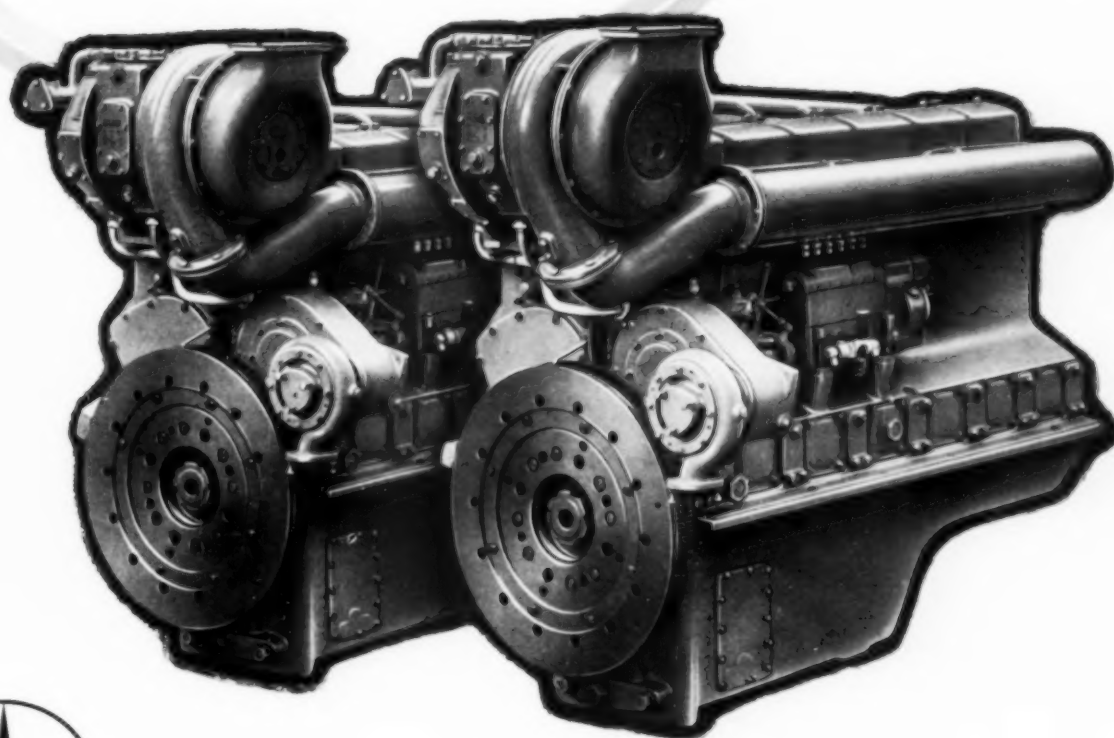
- Cummins NH-6-B diesel engine
- Fuller R960 Roadranger transmission
- Eaton 2011 rear axle
- Shuler FE11 front axle
- Bendix-Westinghouse full air brake system; 12 cu ft compressor
- Budd wheels
- Pittsburgh "Solex" windshield
- Spicer 14" two-plate clutch
- Ross TE 71 steering gear
- Kysor automatic radiator shutters
- Bostrom driver's seat.





For nearly 50 years Daimler-Benz A.G.  
has been producing diesel engines for every purpose  
in industry, shipping and transport. Mercedes-Benz diesel engines  
are preferred the world over for their economy and endurance.

For further information please contact  
Daimler-Benz A.G. Stuttgart, Germany.



**MERCEDES-BENZ**

MAY 1958

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## Mid-West Diesel News

By L. H. Houck

FORD farm tractor dealers are showing the new Ford diesel farm tractor throughout the Mid-West and a high interest is being shown in diesel economy. Fischer Implement Co., Jefferson City, Mo., is showing the complete diesel line which

runs through the 800 and 900 series. The diesel engine is manufactured by Ford, starts on diesel fuel. Gasoline tractor equipment can be used on the new tractors which pull four plows and operate much more economically.

ONE OF the first diesel taxicab fleets in the nation is the Indiana Cab Co., South Bend, Ind., which has started using

German-built Mercedes-Benz 180-D cab, powered with the 4-cylinder, 46 hp diesel, often called the taxicab engine of Europe because of its wide use.

CUMMINS NH-6-B diesel was the new power for an IHC DC-305 truck, owned by Frank Cadwell, Pueblo, Colo. Cummins Diesel sales, Denver, made the sale.

DOPUCH & Son Const. Co., St. Louis, recently put a Northwest 125 lifting crane in service, powered with a 3-71 GM diesel. Cummins, McGowan & West, Inc., handled the transaction.

DALLAS Pitts, Wynne, Ark., drainage and soil conservation contractor, has added a Lima Jobmaster 25 dragline with a 35-ft boom and a Hendrix bucket. The unit is powered with a 3-71 GM diesel and was sold by Priester Machinery Co., Memphis.

SILVER Fleet Express, Louisville, Ky., has repowered three more units with 175 hp JT-6-B Cummins diesels from the Louisville distributor.

HUNTLEY Construction Co., Rock Springs, Wyo., is using three S-12 Euclid scrapers on their irrigation and farm-to-market road contracts. These units are powered with GM diesels.

GLEASON Equipment Co., Chicago, received the P & H Dealer Award for 1957 for the highest total sales of P & H power cranes and shovels. Many of the units were diesel-powered with the P & H diesel.

W. K. VINCENT, Fort Wayne, Ind., bought two Cummins 175 hp JT-6-B engines from Cummins Diesel Sales Corp., Indianapolis, for repowering two Diamond T 723C trucks.

CENTRAL Engineering and Construction Co., Indianapolis, has the earth-moving contract on the Indiana Farm Bureau 2.6 million bushel grain storage facility. Equipment on the 30,000 cu yds. job, is Allis-Chalmers-TS-260 and TS-200 motor scrapers, and HD-15 tractors and all powered with Allis-Chalmers diesels.

HOWELL Tractor & Equipment Co., dealers for International Harvester, Drott, Hough, Galion, has started construction on its new building at Elk Grove, Ill., 17 miles northwest of downtown Chicago. The land area consists of 170,000 sq ft, the enclosed area, 25,240 sq ft, with a 9,240 sq ft concrete apron for shipping, receiving and extra work space in good weather.

WESTERN Indiana Gravel Co., Montezuma, Ind., has installed a Cummins HRCIP-4 diesel in a Marion Model 331 crane. Cummins, Indianapolis, made the sale.

RAY DIDIER, golf course construction specialist, Mundelein, Ill., uses a Caterpillar No. 955 Traxcavator, a D-4 and a No. 40 scraper. Sales were made by Caterpillar dealer Patton Tractor & Equipment Co., Bellwood and Rockford, Ill., and Hammond, Ind.



## WHEN IT MEANS THE MOST YOU CAN TRUST F-M DIESELS

Walter A. Broll, Chief Marine Division, who directed operations aboard the *Mayor Thomas D'Alesandro, Jr.* that averted disaster in Baltimore.



In crowded Baltimore Harbor, disaster threatened.

Wreathed in smoke and leaping flames lay a motor tanker with a 500,000-gallon high-octane cargo of potential death and destruction.

To the urgent call came the city's newest fireboat, *Mayor Thomas D'Alesandro, Jr.* Powered by twin Opposed-Piston marine diesels, this highly maneuverable vessel helped tow the tanker to deeper water, reducing the threat to nearby shipping. Another identical pair of O-P diesels powered the fireboat's two 10" fire pumps that smothered the flames under water at the rate of 12,000 gpm.

Heroic men, modern fire-fighting equipment and dependable O-P power combined to win this tense contest with savage flame. Wherever there is a need for reliable power, produced economically, you cannot match the standard set by F-M Opposed-Piston diesels. Fairbanks, Morse & Co., Chicago 5, Ill.



## FAIRBANKS-MORSE

a name worth remembering when you want the BEST

DIESEL AND DUAL FUEL ENGINES • DIESEL LOCOMOTIVES • RAIL CARS • ELECTRICAL MACHINERY • PUMPS • SCALES • HOME WATER SERVICE EQUIPMENT • MAGNETOS

HILDE Construction Co., Great Falls, Mont., has purchased two Cummins 130 hp JN diesel engines for installation in a Buffalo-Springfield roller. Cummins Diesel Sales of Montana at Billings, made the sale.

FEDERAL Express Co., Indianapolis, recently purchased three 190 hp HRFB Cummins diesels from the local dealer for repowering White 4400 TD's.

RALPH Neff Trucking Co., Rapid City, South Dak., took delivery recently on a 175 hp Cummins JT-6-B diesel for repowering a truck. Cummins Diesel Sales of Montana, Billings, made the sale.

EMERY Transportation Co., Chicago, now have 40 Mack diesels in their Mid-West-East run of tankers, pulling 32,000-lb loads, and running from 70 to 90,000 miles per year. Total fleet numbers 200 diesels.

COLORADO Wholesale Grocery, Grand Junction, has repowered a Peterbilt 351 with a 250 hp NT-6 Cummins diesel from Cummins Diesel Sales Corp., Denver.

### Engines Give Long Life

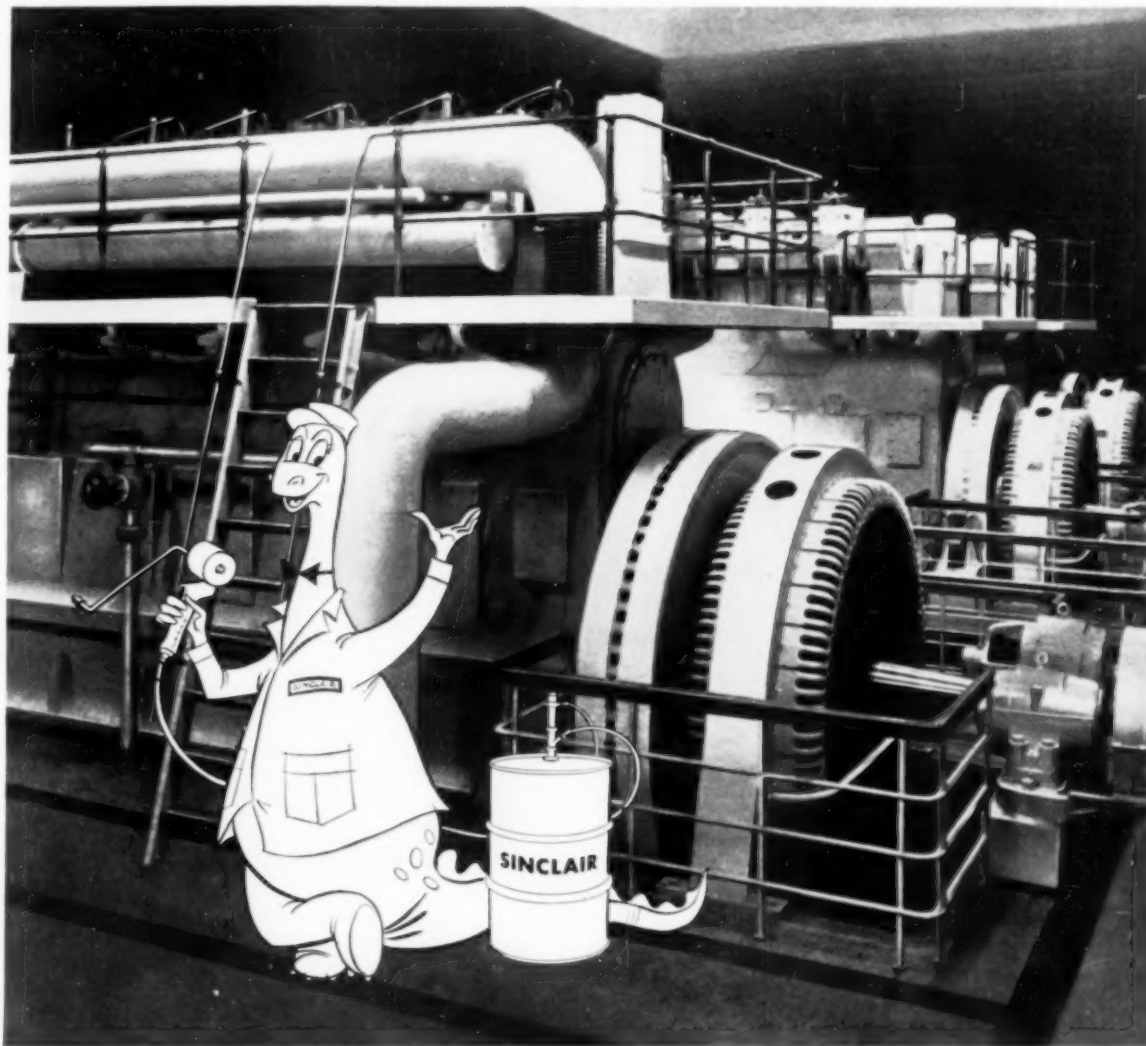
Often preached and only sometimes practiced, regular service and maintenance may mean the difference in a long or short life for a diesel engine. Dramatically underscoring this fact is the experience of a large manufacturing plant in South Carolina. There, a diesel engine, operated for 25,000 clock hours on an inspection showed so little wear that parts replacement was limited to piston rings. One of 40 Caterpillar D361 diesel engines used to generate electricity for experiments at the plant, the unit was installed in January, 1952. The 40 engines are run in banks of four, with each getting one week in four off for servicing. In this manner, each engine runs 24 hours per day, three out of four weeks, 12 months a year. Due to the importance of dependable, continuing operation in the plant's work, the engines are kept in top performing condition at all times. Regular service schedules, as supplied by Caterpillar, are observed and maintenance performed on call from the operating group. At regular intervals, oil is changed, using the grade and weight specified by the manufacturer.

When the engines began approaching 25,000 hours in November of 1957, the plant's equipment maintenance division decided to disassemble one engine to investigate wear and need for overhaul or replacement of parts. As each part was removed, it was carefully checked against the original manufacturer's recommended wear limits. Only two piston

rings, .001 out of tolerance, exceeded the limits. Bearings, pistons, cylinder liners, shafts and other moving parts still were well within the recommendations. The only other work between installation and disassembly was performed at about 18,000 hours, when the heads on the V-type engine were cleaned and interchanged to eliminate carbon buildup. At the same time, valve guides

were reconditioned. Because of the low wear at 25,000 hours, the engine was reassembled with a new set of piston rings as the only replacement. The chief supervisor of the plant's equipment maintenance division at the plant, believes that the outstanding record of this engine is due largely to carefully observing service and maintenance recommendations.

**HERE IS IMPORTANT INFORMATION!** The completely new 1958 edition of the **DIESEL ENGINE CATALOG**, Volume 23, is now available. If you design, purchase, sell, operate or service diesel, dual fuel or gas engines, the Catalog is essential to you. This giant, 400 page, 10 1/2" x 13 1/2", fully illustrated reference book has been revised, rewritten and brought up to date completely from cover to cover. Send your order in now for this limited edition, which costs \$10 postpaid plus California sales tax where applicable. Send checks or company orders to **DIESEL ENGINE CATALOG**, 816 N. La Cienega Blvd., Los Angeles 46, Calif.



Maintenance tips from Dino, the Sinclair Dinosaur

NOW-  
less oil  
consumption

Sinclair RUBILENE® Oil has a great reputation in industrial Diesel applications — and for several good reasons. Engineers have found that Sinclair RUBILENE can cut oil consumption, reduce service time to a minimum. It prevents the formation of harmful carbon, sludge and varnish. It stands up under the highest operating temperatures, provides better lubrication protection to cylinders, pistons, rings and other vital moving parts.

Switch to Sinclair RUBILENE and lower your costs. Whatever the make or age of your Diesel, whatever your lubrication problem, there's a RUBILENE or RUBILENE HD Oil that should meet your requirements. Call your Sinclair Representative for further information or write for free literature to Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. There's no obligation.

**SINCLAIR**  
**RUBILENE OILS**

## West Coast News

By James Joseph

TO SOUTHERN Pacific Co., San Francisco, a Fairbanks-Morse model 49B41½, 58 hp diesel engine.

INSTALLED in Canada's Westcoast Transmission Co. Ltd's Compressor sta-

tion #1 (one of four stations operative on this natural gas distributor's 650-mile, 30 in. pipeline), six KVS Ingersoll-Rand gas-engine driven compressors.

FOR Montebello, Calif's Constructors Transport Co., a Cummins NH 220 hp engine destined for a Sterling truck.

TO C. J. PAINTER, Othello, Wash., a

200 kw trailer-mounted generator set (Allis-Chalmers model 8DCS2505 diesel engine), for gravel plant operation in Othello-Pasco, Wash. area.

FOR GALLUP, N. Mexico's Whiting Brothers, an NHS Cummins 290 hp engine for Mack B-733-S truck.

FOR IMPERIAL Hay Growers Assn.,

Brawley, Calif., a Cummins NH 220 hp engine, powering Peterbilt 280 COE rig.

DELIVERED: three Model 49 Fairbanks-Morse generating sets to Draucker-Farrow, Palo Alto, Calif.

CHARLES A. Langlais & Son, Inc., San Francisco, has taken delivery of a Fairbanks-Morse Model 48, 16 hp generating set.

TO HALLIBURTON Oil Well Cementing Co. Norwalk, Calif., a Cummins 335 hp NRTD engine to power a Howco T-10 pump.

PORTLAND-Seattle Freight Co., Seattle, has repowered a Kenworth 522 RR truck with a Cummins NH 220 hp engine.

TO E. C. SWAGGART, Eugene, Oregon, a 300 kw trailer-mounted generator set with Allis-Chalmers 8DCS2505 engine and generator.

MERLE Manuel, Lewiston, Mont., has repowered his Kenworth rig with a Cummins NHB 220 hp engine. Sale via Cummins Diesel Sales of Billings, Montana.

FOR THE boat *Thundercloud*, a GM 4971-A diesel, which operates out of southern California anchorages. Owner is C. G. Willis.

FOR WILLIAM S. Clark's motor sailer, a GM 2-71 diesel swinging 22 in. x 18 in. prop thru 2:1 reduction. Craft operates out of Santa Barbara, Calif.

THE PURSE seiner *Courageous*, San Pedro, Calif., has been equipped with a GM 3-71 driving 30 kw generator for powering refrigeration.

ROGER Jessup Certified Farms, Glendale, Calif., has purchased a Cummins NT 250 hp engine to power its International COE truck.

TWO GM 2-71s furnish main propulsion for Joe Martin's new, 40 ft sport-fishing boat *New Dina Lee*, operating from San Pedro, Calif's 22nd street landing. Engines swing 28 in. x 25 in. props through 2:1 reduction to get speed up to 16 knots.

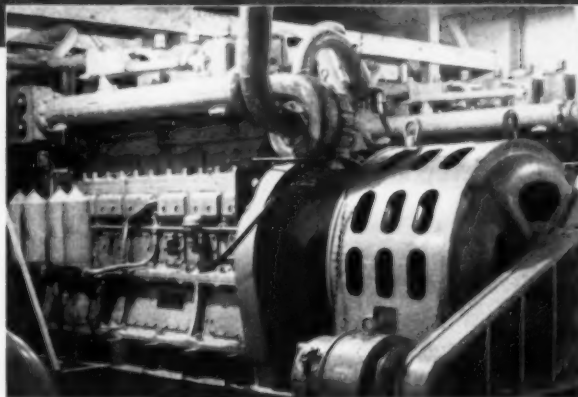
DUE FOR installation at Northland Utilities Ltd's Hay River powerhouse (in Canada's Northwest Territories), a Cooper-Bessemer GS-6 diesel driving a 344 kva English Electric generator.

OPENED at milepost 52 on Alaska Highway, one of the first Mercedes-Benz agencies which is popularizing diesel-engined Mercedes 180-D. Agency is Me-



# 40° below zero IN CANADA'S EASTERN ARCTIC

GENERATOR SETS  
powered by  
**WAUKESHA**  
*Diesels*  
supply all electric power  
for mine, mill, townsite  
and camp



On a northern inlet of Hudson Bay, 1950 air miles northwest of Toronto—where daytime temperatures hit 40° or more below zero, and the miners are Eskimos—is Canada's most northerly nickel mine. In so remote a spot the powerhouse engines must be reliable. They are. Both are Waukesha Diesels. They drive the generator sets that supply all electric power for mine, mill, townsite and camp of the North Rankin Nickel Mines, Rankin

Inlet, Northwest Territory, Canada. Production is 250 tons daily; ore is high grade and shipping concentrates run 13% nickel; 2.5% copper. The two Waukesha Diesels are Model LRDBS Turbo-supercharged 6-cyl., 8½ x 8½ in., 2894 cu. in. engines. • Waukesha Enginators (engine-driven generator combinations) for Diesel, gas, or gasoline fuels are also available up to 800 KW. Send for literature.

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WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN • New York • Tulsa • Los Angeles

Mahon Mercedes Sales and Service. Owner is Bill McMahon.

HAROLD Pom-Arleau has powered his Kenworth 523C truck with a Cummins 220 hp NH engine. Sale via Cummins Diesel Sales of Washington, Seattle.

#### Staff Personnel

Personnel to staff Twin Disc Clutch AG's new technical office at Zurich, Switzerland, have been announced by John H. Batten, President, Twin Disc Clutch Company, Racine, Wisconsin. They are: Hans Tagger, European Sales Manager; Hans Weber, Office Manager; Max Albrecht, Accountant; and Grete Langenberg, Multi-Lingual Secretary.

#### Brochure On Towboats

A new 28-page, illustrated brochure entitled *Towboats* is being distributed by Dravo Corporation, Pittsburgh. Containing several full-color photographs and fifty other pictures, the 11 in. by 14 in. brochure, Bulletin 239, discusses various phases of towboat design and construction, setting forth "some of the things learned in 40 years of building towboats that return substantial profits to their owners." Included are an introductory chapter on the specialized nature of river transportation and sections on propulsion, control, accommodations and accessories, research, design and engineering, and towboat construction.

Under propulsion are covered such questions as hull design, tunnel stern, Kort nozzles, and propellers. The control section includes steering, stopping, Kort nozzles, and pilothouse and engine room controls. Copies of Bulletin 239 may be obtained by writing to C. J. Donoghue, manager-marine sales, Dravo Corporation, Neville Island, Pittsburgh 25, Pa.

#### Huge Dredge To Be Built

Keystone Division of Dravo Corporation has announced plans for construction of one of the largest dredges on the nation's inland waterways designed to produce sand and gravel aggregates. Complete with its own heavy media plant, impact crusher and scrubber, the dredge is estimated to cost about \$2,000,000 and will dig about 500 tons of material an hour. It will be built at Dravo's Neville Island shipyards and is scheduled to enter service in 1960. Equipped to separate four grades of aggregate, it is planned to operate the new dredge on the Ohio River between Pittsburgh and Steubenville, Ohio. Reserves in this area are estimated to be sufficient to supply Keystone Division's sand and gravel requirements for the next 25 years. Now in the engineering stage, the dredge will be 200 ft long, 53

ft wide and 8 ft 9 in. deep. Powered by two 500 kw diesel-electric generators, it will be equipped with a bucket ladder to scoop up material from the river's bottom.

#### Compressed Air Filter

A new single-tube Fullflo filter for compressed air is made from nickel-plated

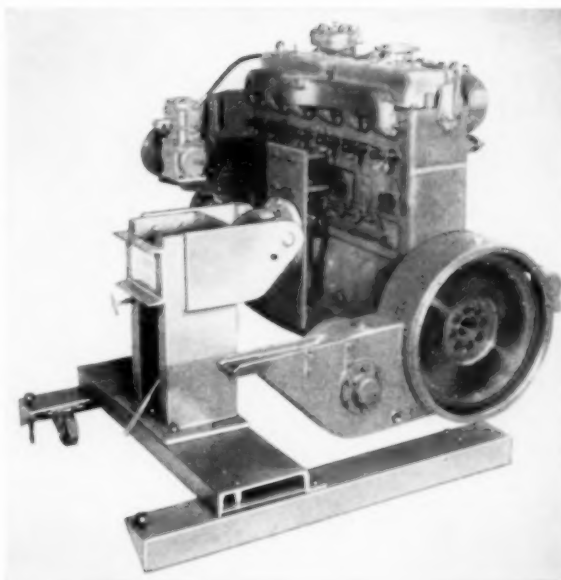
brass to eliminate any possibility of iron contamination or rust. 7 inch honeycomb filter tubes provide depth filtration to minimize gumming and remove moisture, oil, microscopic rust and dirt particles. Flow rates are 50 cfm (free air) at 40 psi; 70 cfm at 80 psi; 76 cfm at 100 psi. Streamlined head with single center bolt provides for speedy servicing. Only one nut needs to be loosened to replace

element. Filter is supplied with or without mounting bracket for  $\frac{1}{8}$  in. or  $\frac{3}{4}$  in. pipes. Honeycomb filter tubes are available in a wide range of controlled densities to provide the exact degree of micro-clarity needed for each operation. Technical literature is available on request from Commercial Filters Corporation, 2 Main Street, Melrose, Massachusetts.

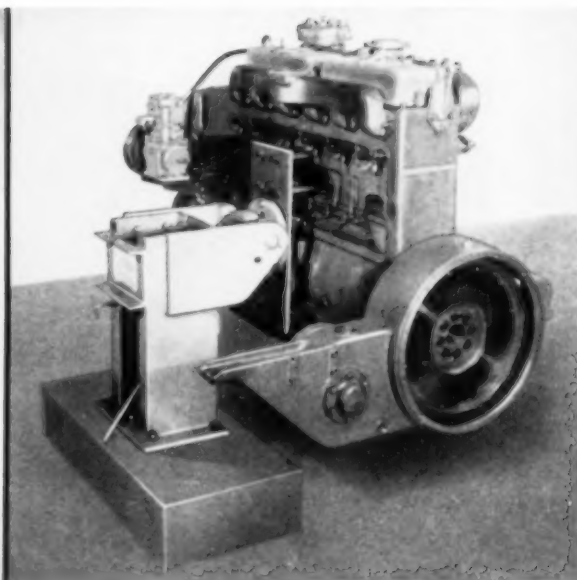
ITS NEW

FIELD TESTED AND APPROVED:

## New Kent-Moore Universal Diesel Engine Stand



J6837 MOBILE STAND has two fixed and two swivel casters for mobility. Floor locks hold stand in place. Like permanent Universal Engine Stand, it's engine manufacturer approved.



J7329 STATIONARY STAND has floor-mounting base for permanent installation. Both models are only 32" high at mounting flange, 35" high with pump fully extended and engine in horizontal position.

**Handles all popular makes • hydraulically powered • eliminates hand cranking**

The most versatile engine stand ever designed for automotive-type Diesel and gasoline engines, the Kent-Moore Universal Engine Stand handles with ease the largest popular makes and models that can be side-mounted. Hydraulically powered for quick, easy positioning, the Universal Engine Stand eliminates all hand cranking.

Full-range adjustment relieves fatigue, permits repair or removal of any component from top, bottom or side of the engine at comfortable, work-bench level.

Swivel plate swings freely on tapered roller bearings through full 360° circle, locks securely in any desired position.

Available in either portable or permanent installation model, the Universal Engine Stand is engineered for rugged, day-after-day duty. A wide range of adaptor plates permits servicing of nearly 50 different models of Allis Chalmers, Caterpillar, Cummins, Detroit Diesel, IHC, Mack and White Diesel engines.

58-D2



**KENT-MOORE**  
ORGANIZATION, INC.  
28635 MOUND ROAD, WARREN, MICHIGAN  
ENGINEERS AND MANUFACTURERS OF SERVICE TOOLS AND EQUIPMENT

## Car Ferry



The first direct railway route from southern Norway to Denmark will be placed in operation by June, 1958, when the Kristiansand-Hirtshals Ferry

goes into service. The new ferry will be able to carry seven railway cars in addition to about 40 automobiles and approximately 600 passengers. Kristiansand Dampskipsselskap of Kristiansand, Norway are the owners of the new car ferry. They have run a cargo and passenger service on this route for more than 50 years and recently completed the negotiation of the necessary cooperative agreements with the Danish and Norwegian authorities for the year round transport of railroad cars. Docks with railway connections will be completed at both ports in November. Knud E. Hansen, Copenhagen designed the ship which will have two propelling diesel engines, each driving a controllable pitch propeller. The hull for the new boat was built by Pusnes Mek. Verksted in Arendal, Norway under subcontract from Kristiansand

Mek. Verksted. The ship was then towed to the KMV yards at Kristiansand for outfitting in accordance with the plans prepared by David Sandved of Haugesund, in cooperation with the owners.

The ship has a beam of 45.23 ft and a length overall of 265.5 ft. There is one railway track on the reinforced car deck. The steel hull is fully welded in prefabricated sections and the superstructure is built up by strong web frames and longitudinal framing. The main diesel engines are four-cycle, 12 cylinder Nordberg V-type, each rated 2740 shp at 515 rpm. The cylinders have a 13 in. bore and the piston stroke is 16½ in. The engines use the Supairthermal system of turbocharging. Each engine is direct connected to a 1:1.65 reduction gear, supplied by Maag Gear-Wheel Co., Ltd., Zurich, and drives a Liaaen variable pitch propeller. The trial speed will be about 18 knots. The two Nordberg engines and the two variable pitch propellers are directly controlled from the bridge and there are twin rudders which are maneuvered by electric hydraulic steering gear. In addition, there is a 300 hp Voight-Schneider propeller under the bow, which is intended for navigation at low speed when maneuvering into the ferry harbours. This propeller and the ship service electric requirements will be supplied by three Bergen Mek Verksted diesel-generators, each with a capacity of 300 kw at 500 rpm.

## Management Changes



Albert G. Massey



Fred C. Erdman

Fred C. Erdman retired March 31 as Product Manager of hydraulic Governors at the Marquette Division of Curtiss-Wright Corporation, Cleveland. Since April 1, the new Product Manager has been Albert G. Massey, who will direct the sales of Marquette and Massey types of Curtiss-Wright Governors. Mr. Erdman joined Marquette in 1938 and under his leadership Marquette Governors became widely used for speed regulation of diesel engines and other prime movers in many fields.

Mr. Massey brings to his new post many years of experience in the application of hydraulic Governors. He has been General Manager of Massey Machine Division of Curtiss-Wright Corporation in Watertown, New York. To further expand the sales organization at the Marquette Division, L. J. Moulton has been transferred from Product Engineer for Governors to the new position of Staff Application Engineer. This assignment will include Governor application engineering responsibility. Mr. Moulton came with Marquette in 1946, and has been active in several phases of the diesel industry. He is chairman of the ASME Test Code Committee and a member of the AIEE-ASME Specification Committee on speed governing performance of internal combustion engine-generator units.

**The Purchasing Agent of  
a transcontinental railroad  
inquired when visiting our plant  
five years ago,**

***"Why have we  
not done this  
before?"***



CHANNELCROMED Four Cycle Diesel Engine Liners

Answer is that before adopting Channelcromium, Operating ran a 3½ year service test of all available brands and types of chromium—all other types first—and would not believe that a set of Channelcromed liners could operate a year with no measurable wear, and with no failure as by scuffing, peeling, or that Channelcromium could reduce lubricating oil consumption by 60%. Liners Channelcromed for this railroad have been in operation now since early 1951, without replacement. An annual purchase order covering their requirements has been received from this railroad for years—diesel engine liners and air brake compressor cylinders.

YOU are invited to run your own individual comparative service operating tests.

Write for Bulletin 76.

**PENNINGTON CHANNELCROMIUM COMPANY**

319 Dakota Street

San Antonio 3, Texas

The Marquette Division also announces that all manufacturing and engineering facilities for governors are now concentrated in Cleveland, where both Marquette and Massey models of Curtiss-Wright hydraulic Governors are being produced. Several new types of Curtiss-Wright Governors are in the development stage and will be introduced during 1958. District service representatives for Curtiss-Wright Governors are located in Watertown, Cleveland, Houston, Bartlesville, El Paso, New Orleans, San Francisco, and Los Angeles.

### Torque Wrench Development

P. A. Sturtevant Co. has recently announced a new approach to high torque application requirements. Now, by using a conventional light weight, small size low capacity torque wrench, a new series of



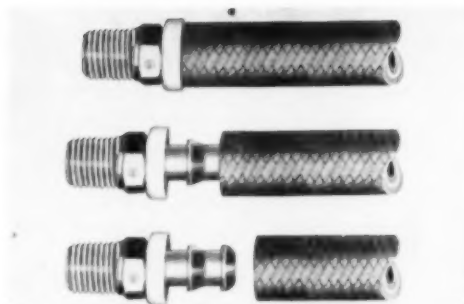
multi-purpose adapters enables increasing the range of a conventional torque wrench to as much as 900 ft lbs. A number of versatile combinations are available as standard stock items. A normal 150 ft lb capacity torque wrench can be increased for applications as high as 300 ft lbs. A normal 200 ft lb capacity torque wrench can be increased for applications as high as 400 ft lbs. A normal 300 ft lb capacity torque wrench can be increased to 6 or 900 ft lbs. Because Sturtevant torque wrenches are equipped with pivoted floating handles, which concentrates the load position, they may be used for accurate applications with these new multi-range, multi-purpose adapters.

The multi-purpose torque wrench adapter accessory is a heavy duty, light weight conventional hand tool and enables using box end openings, ratchet end, or conventional drive squares, so that sockets can be used. Each of these adapter end accessories may be interchanged and yet maintain the proper lever length of the adapter. A wide range of box end openings are available from  $\frac{3}{4}$  to  $2\frac{1}{2}$  in.

Some customers will find it necessary only to invest in a single torque wrench rather than two or even three due to the multi-range feature of this new product. A descriptive brochure is now available upon request for this new product. Write P. A. Sturtevant Co., Addison, Illinois. **ITS NEW**

### Push On Hose Ends

The Weatherhead Company, Fort Wayne Division, claims faster, easier on-the-job hose assembly installations are now possible with their new Barb-Tite push on hose ends. Just push the hose on to barbed inserts and the hose assembly is ready to use. Barb-Tite push on hose ends are machined from tough dense extruded bar stock. The manu-



facturer claims the precision machining of the barbed insert assures a positive grip leakproof seal to withstand working pressures up to 250 lbs psi with a minimum burst pressure of 1000 lbs psi. Designed for repeated use Barb-Tite hose ends are

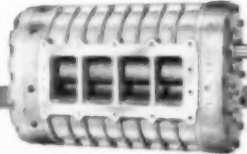
designed for a wide range of industrial and automotive low pressure applications such as fuel and oil lines, air lines and vacuum gauge lines. Weatherhead sources of supply have Barb-Tite ends in all popular end styles in sizes from  $\frac{1}{4}$  in. through  $\frac{3}{4}$  in. I. D. **ITS NEW**

**HERE IS IMPORTANT INFORMATION!** The completely new 1958 edition of the **DIESEL ENGINE CATALOG**, Volume 23, is now available. If you design, purchase, sell, operate or service diesel, dual fuel or gas engines, the Catalog is essential to you. This giant, 400 page, 10  $\frac{1}{2}$  x 13  $\frac{1}{2}$  inch, fully illustrated reference book has been revised, rewritten and brought up to date completely from cover to cover. Send your order in now for this limited edition, which costs \$10 postpaid plus California sales tax where applicable. Send checks or company orders to **DIESEL ENGINE CATALOG**, 816 N. La Cienega Blvd., Los Angeles 46, Calif.

**The economical,  
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**12 production models...  
the unit you need for  
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**Superchargers  
Industrial Blowers**

**PRECISION BUILT FOR LONG,  
DEPENDABLE SERVICE**

3-lobe design results in small cube, light weight. Helical gears and rotors machined to fine tolerances for smooth, trouble-free performance.



Miehle-Dexter Supercharger Division, Racine, Wisconsin • Telephone MEIrose 4-5521 • Another Product of Miehle-Goss-Dexter, Inc.

Another

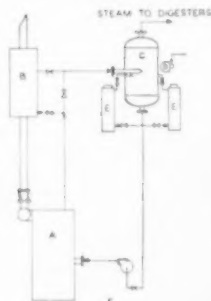
## VAPOR PHASE<sup>®</sup> INSTALLATION REPORT

### COMPLETE VAPOR PHASE<sup>®</sup> Heat Recovery and Cooling Systems Designed and Furnished by Engineering Controls

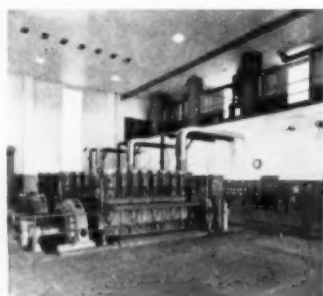
#### San Jose Sewage Disposal Plant Reports . . .

These Operating Advantages with VAPOR PHASE<sup>®</sup> on the Job:

- **Prevention of Corrosion** due to sulfur in sludge used as main fuel.
- **Estimated Fuel Economy of 4%.**
- **Constant Operating Temperature** regardless of load.
- **Less Wear.** No moisture condensation in engine cylinders because temperatures never drop below dew point of 194°F.
- **Dollar-Saving Heat Recovery** that provides (a) steam for digesters and (b) space heating for buildings.



- |  |                                |
|--|--------------------------------|
| A — Engine                                   | D — Make-up Valve              |
| B — One of 3 Exhaust Heat Recovery Silencers | E — (2) 75 KW Electric Heaters |
| C — Single Vapor Phase Separator             | F — Water Pump                 |



Mezzanine area shows space saving installation of Exhaust Heat Recovery Silencers, single Vapor Phase<sup>®</sup> Separator, and standby Electric Immersion Heater — all designed by Engineering Controls to service the three Enterprise 655 hp dual-fuel diesels.

"Sole Developers and Manufacturers of Vapor Phase<sup>®</sup> Thermal Circulation (Ebullition) Engine Cooling Systems"



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#### Sales Manager Appointed



John Clem

The appointment of John Clem to the position of Sales Manager has been announced by W. B. Watterson, Vice-President and Director of Sales for the Air-Maze Corporation. A graduate in Mechanical Engineering, Mr. Clem has been District Manager of the company's Chicago office, after serving for three years in the Eastern Territory. Before coming to Air-Maze, Mr. Clem was associated with the Fairbanks-Morse Company in its Experimental and Research Departments after which he was assigned to general diesel sales. Mr. Clem's appointment fills the vacancy created by the resignation of Frank Purvis from the company.

#### New Plant For Custom Built Controls



Custom Built Controls, Inc., manufacturer of automatic engine controls and frequency relays, recently moved into its new plant located at 775 Sheridan Boulevard, Denver, Colorado. This new building contains nearly three times the floor space of the former location. There is ample room at the new site for future expansion plus adequate parking space. In addition to larger manufacturing area and modern offices, a well equipped laboratory is provided for experimental and development work on new products. The company has expanded its sales force and now has fifteen manufacturer's representatives to serve their customers all over North America including Canada and Mexico. A new brochure, available on request, gives full information regarding the new plant and all the representatives.

#### Railroad Division Manager



Robert Aldag

V. H. Peterson, Vice President—Sales, Fairbanks, Morse & Co., Chicago manufacturer, has announced the appointment of Robert Aldag as Manager of the Railroad Division. Mr. Aldag has been with Fairbanks, Morse & Co. a number of years as a sales engineer, and Manager of the Sales Engineering Department. He is a graduate of Purdue University where he specialized in railroad mechanical engineering. Following his college career he started with the Erie Railroad and later joined the Chicago, Burlington & Quincy Railroad Company where for a number of years he supervised operation and maintenance of diesel loco-

motives. In his new function as Manager of the Railroad Division, Mr. Aldag will direct his attention particularly to the sale of Fairbanks-Morse diesel locomotives and small diesel engines which the company is now promoting in the field of mechanized railroad refrigerator cars.

#### Universal Dynamometer



Introductory showing of the new Clayton Universal Tractor and Engine Dynamometer Test Equipment was made at a meeting of the National Standard Parts Association held recently at the Ambassador Hotel, Los Angeles. This equipment provides for checking power characteristics of Tractors and other Off-Highway Equipment without removing the engine from the chassis, and for Dynamometer Run-in and Test of basic engines and power units. Shown above are J. A. Cortright, Vice President in Charge of Sales at left, and George R. Mackey, Sales Manager of the Dynamometer Division of Clayton Manufacturing Company, using a model of the unit to point out salient features. The Universal Tractor and Engine Dynamometer Test Equipment will cover the horsepower range of all popular tractor models powered with engines rated up to 450 hp and developing up to 1800 lbs ft torque at 1000 rpm at the Power Take-off, and all basic engines and power units with mechanical clutches or torque converters rated up to 700 hp, developing up to 2600 lbs ft torque from 1000 rpm and weighing up to 24,000 lbs. Use of the Clayton Tractor and Engine Dynamometer Test Equipment is made simple and fast by the use of Clayton Universal Mounting Equipment and Adapters. **ITS NEW**

#### Work Progresses on Expressway



The first of three sections of the 13-mi. Cross Westchester Expressway being constructed to link the New England Thruway at Rye, N. Y., to the New York Thruway at Elmsford, N. Y., is well under way. Rusciano and Sons Corp., Pelham Manor, N. Y., under a joint venture with Del Balso Construction Corp., is constructing this first portion, called the White Plains Section, which begins in

the town of Greenburgh, and terminates in Harrisburg, N. Y. The White Plains section of the connecting expressway includes 4.26-mi. of thruway roadway and 11 miles of access road construction. A total of 22 bridge structures will be erected along this route. There will be one major interchange in the 4.2-mi. of expressway construction. A total of 11,100 ft of the Mamaroneck River will be relocated and the old channel used for new expressway right-of-way. Rusciano's share of the \$13,576,000 project, includes clearing, demolition, grading, structures, drainage, and paving.

The job, being done under the New York Department of Public Works, calls for an estimated 1,300,000 cu yds of unclassified material to be moved, plus 100,000 cu yds of trench and culvert

excavation. The material to be shifted includes granite, rock, clay, sand and some gravel. Better than 50 per cent of this material is rock. The terrain here will necessitate maximum cuts of 60 ft and fills of 30 ft. Construction is on an average 150-ft wide right-of-way for the expressway. The finished road will be a dual construction on each side having three travel lanes of 12, 13, and 12-ft, divided by a 20-ft grass mall. Maximum travel grade will be 3 per cent. Construction on this stretch will go through the center of the city of White Plains, N. Y. The other two sections will be let at later dates. Total cost of the three sections will be about \$30 million. Rusciano is using a fleet of eight International TD-24 crawler tractors on this job. The project is scheduled to be completed by Oct. 1, 1959.

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AP-174-820

## Florida Diesel News

By Ed Dennis

AT PUMP station #7 of the Central & Southern Florida Flood Control Project, Belcher Oil Co., the contractor, took delivery of a Delco portable light plant powered by a General Motors 4-71 diesel. The control panel reads:

75 kw 115/230 Volts, 3 phase 60 cycle 1800 rpm. A Maxim MUC silencer was included.

THE CITY of Sebring will receive a 10 cyl model 38F51 $\frac{1}{4}$  Fairbanks, Morse generating set rated 750 hp for their light plant.

FOUR Euclid S12 hydraulic tractors

and scrapers powered with General Motors 6-71 diesel engines rated 218 hp at 2100 rpm plus Fuller 5F1220 transmissions and Borg-Warner clutches were delivered to Capeletti Bros. of Hialeah by Llewellyn Machinery of Miami.

IN THE Tampa area, the Mc Hough Dredging Company repowered their 8 in. dredge with a model HRIS 225

Cummins diesel engine rated 225 hp; 8 V belts drive the sand pump through the power take-off. A model NTO262 Cummins powered the company's 10 in. dredge; both came from Cummins Diesel Engines of Florida.

MERCEDES-BENZ diesels model OM-636 and rated 35 hp at 2550 rpm power the several Unimog tractor trucks received by J. W. Goode of Fort Myers.

SIX new Ford diesel marine engines were received by the Key West Fish Co. for installation in fishing craft owned by them. These were the 4 cyl model X, 220 cu in. displacement engine with 68 shp and 2:1 Capitol rkr gears; from Southeast Diesel Marine of Miami.

THE Tampa Bay Pilots Assn. at Eggmont Key, received for their 40x12 ft pilot boat a model 6120T General Motors diesel engine with 1.5:1 GM hydraulic rkr gears. Sixteen knots is the new speed; from General Engine & Equipment Company of Tampa.

ALLIED Marine Corp., on the Miami River, was appointed the new South Florida distributor for the Mercedes Benz marine diesel engines.

SHELLEY Tractor & Equipment Co. delivered, to Bransfield and White of Ojus, two DW21, two wheel, series C tractors with 25 cu yd  $\pm$  470 scrapers. The 6 cyl turbocharged Cat diesel engines are rated 300 hp. This equipment will be used at the Carol City housing project.

FOUR Allis Chalmers model 6DCS-1879, supercharged diesel generating sets with 150 kw Allis Chalmers generators were installed as auxiliary light plants in the new Engineering & Experimental Building at Patrick Air Force Base at Cocoa, Florida.

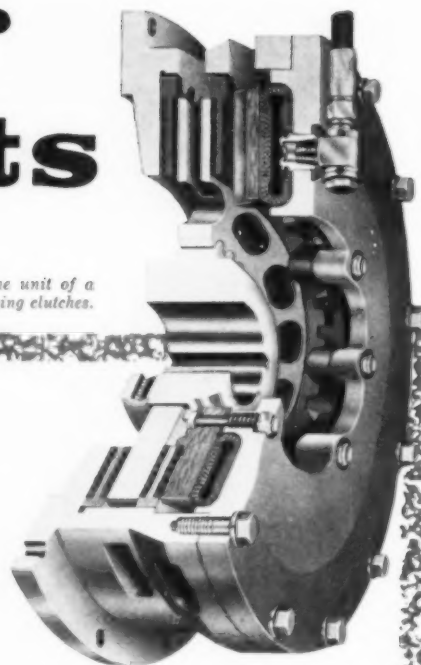
FROM the Tampa office of Cummins Diesel Engines of Florida we heard that the Southern Truck Leasing Corp. of Dade City took delivery of 21 model RD405 International COE hi-way tractors with model HRF 600 Cummins diesels and Fuller 10 speed transmissions. These diesels are rated 180 hp at 2000 rpm.

LEHIGH Cement Company took delivery of five 12 yd converted to 15 yd Euclid dump trucks. These are powered with 218 hp General Motors series 71 diesel engines and have Fuller transmissions and Borg-Warner clutches.

SOUTHEAST Diesel Marine of Miami was appointed distributor for the Ford marine diesel engine for Dade and Broward Counties. Al Metzger is general manager at the Miami office.

# Air-Operated clutch for work boats

Cutaway section showing one unit of a typical pair of marine reversing clutches.



**Positive control... smooth operation...  
quick response... sharply reduced  
maintenance cost**

Wichita Clutch Co., Inc. and Cleveland Diesel Engine Division of General Motors have successfully developed the Wichita principle of a disc-type air-operated clutch for use on work boats using Cleveland Diesel Engines.

Extremely simple in design and operation, the Wichita Marine Clutch consists of a pair of disc-type clutches actuated pneumatically by rubber tubes which force friction discs and floating plates together.

The main advantages which this clutch offers are: (1) positive control of propeller speed throughout its entire range, (2) smoother operation with single, remote lever control, (3) quick response, (4) sharply reduced maintenance costs. Above

all, it provides controlled slippage at low speeds — gives the operator "feel" of the vessel.

### PROVED IN SERVICE

This clutch has been in service in The Great Lakes Towing Company's tug "UTAH" for more than one year. Owners report this tug has exceeded all expectations in its daily duties of handling large ore vessels in the confined waters of the inner harbors of Cleveland and Buffalo. As a result, The Great Lakes Towing Company recently ordered 7 more tugs modernized with Wichita clutches and Cleveland Diesel Engines. The first application on the East Coast has now been completed by Cleveland Diesel in the tug "ATHENA," operated by the Boston Tow Boat Company. 15 additional work boat installations will soon be completed.



TWO UD14 A International diesels are being used on construction work at Pump Station #7 of the Central & Southern Florida Flood Control Project. One is in a Jaeger air compressor unit and the other in a 1½ yd Bucyrus-Erie dragline; this is the 4 cyl rated 76 hp at 1400 rpm governed speed diesel engine; from Florida Georgia Tractor Company.

THE *Humble A. C.* #5, a 125x24 ft tug and personnel craft was launched recently by Tampa Fabricators for the Humble Oil Co. This twin screw vessel has a General Motors series 71 quad on each shaft for propulsion and two 100 kw Delco generating units for auxiliary purposes.

A PETTER 6 bhp diesel engine with power take-off to run the air compressor and a 1 kw generator is used on the *Sandra G* a towboat owned by the Hillsborough Towing Co. of Tampa. The main propulsion is a D397 Caterpillar diesel with a Ross heat exchanger.

THE Hendry Corp. of Rattlesnake, Florida, built a 36x17 pusher type tug with a General Motors twin 6-71 diesel driving an outboard marine propulsion unit for the Mechling Barge Lines of Tampa. It will be used to switch grain barges around the harbor for the two new breweries.

PANAMA bound are two #655B P & H Harnischfeger 1½ yd shovels powered with Caterpillar model D326F diesels rated 150 hp. Both have Cotta transmissions.

A MODEL DRXC Hercules diesel in the Rome road grader for the City of Hialeah is a 4 cycle 6 cylinder engine and is rated 147 hp at 2200 rpm. It has Purolator fuel oil filters.

A NEW 73 footer has been built by the Morehead City Shipbuilding Corp. Powered by a General Motors 6-110 diesel the *Dottie Irene* will be used for Atlantic Fishing. The diesel has a rating of 210 hp at 1800 rpm, the Allison r&r gears are 4.5:1 and there is a 52x38 four blade Federal propeller; for auxiliary generating there is a 3 kw Onan diesel.

### Facilities Expanded

As a result of its recent move into new quarters which provided three times the former plant facilities, Bacharach Industrial Instrument Company has greatly expanded its Diesel Fuel Injection Service Shop School program. The school covers training in servicing all popular makes and types of fuel injection nozzles, injectors and fuel pumps. The school is normally of one week

duration, and is open to users of Bacharach equipment. It is held periodically when groups of sufficient size can be arranged.

### Named Chief Draftsman

Erwin M. Muenzberg has been named Chief Draftsman at the Waukesha Motor Company where he has been a member

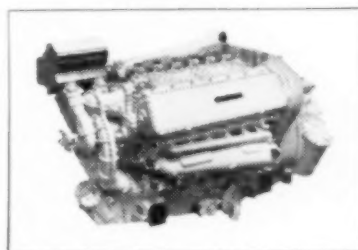
of the Engineering Department since 1928. Before joining the Motor Company Muenzberg worked in the engineering division of the Oil Gear Company of Milwaukee, manufacturers of hydraulic equipment. He also had several years' experience with the Beaver Motor Company in Milwaukee, and early in his career was affiliated with the Nash Woodworking Machinery Co.

**HERE IS IMPORTANT INFORMATION!**  
The completely new 1958 edition of the **DIESEL ENGINE CATALOG**, Volume 23, is now available. If you design, purchase, sell, operate or service diesel, dual fuel or gas engines, the Catalog is essential to you. This giant, 400 page, 10½" x 13½", fully illustrated reference book has been revised, rewritten and brought up to date completely from cover to cover. Send your order in now for this limited edition, which costs \$10 postpaid plus California sales tax where applicable. Send checks or company orders to **DIESEL ENGINE CATALOG**, 816 N. LaCienega Blvd., Los Angeles 46, Calif.



## 'RIGHT ON SCHEDULE!'

—with **NAPIER DELTIC** power



Napier Deltic 18-cyl. opposed piston, 2-stroke diesel marine power unit.

Deltics—Napier-engineered, high speed diesels—reduce shore-to-rig crew transportation times by 50% and more.

Deltics pack a bigger punch into a smaller space than any other marine engine—they are 25% the size of conventional diesel units.

Deltics can cruise a 50-passenger launch at 35 m.p.h. with a comfortable reserve of power in hand.

For fast, reliable, low-maintenance marine transportation, Deltics—9 or 18 cylinders—can be integrated into your design calculations. For more information contact **NAPIER ENGINES INC.**, 909 Dupont Circle Building, Washington 6, D.C. Telephone: North 7-0146.

The boat illustrated is one of the fleet of Thornycroft-built, twin Deltic powered, 50-passenger crew launches operated by the Shell Petroleum Company on Lake Maracaibo. Plans of Deltic powered crew boats suitable for Gulf operation are available.

## NAPIER Deltic marine diesel

FOR THE MOST POWER IN THE LEAST SPACE

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Partners in Progress with The ENGLISH ELECTRIC Company Ltd.



## Diesels All Around The World

By F. Hal Higgins

THE OLIVER Corporation's OC-15 went through the Nebraska test last November with drawbar hp of 94.17 and belt hp 104.64 at sea level. Engine

was the Hercules diesel DRXC type 6 cylinder vertical with compression ratio of 15 to 1.

MASSEY-Harris-Ferguson Limited, Toronto, Canada headquarters has just announced its Ferguson 35 diesel tractor. Engine has 137.8 cu in. displacement with 20 to 1 compression ratio. Belt hp is given as 35.9 max. Tractor

has six forward and two reverse speeds. This new diesel tractor aimed at the small farm market is expected to appear in U.S. farm and small industrial markets soon.

THE Cockshutt 40D4 diesel tractor is another Canadian that has gone diesel. It is powered by a Perkins L-4 diesel engine built in England. Engine develops 52 bhp at 1650 rpm. Cockshutt has been one of the pioneer Canadian farm machinery builders over the past century and some of its lines of plows, combines, etc., have been on the U.S. farm markets for some years.

THE Southern Pacific's 13-mile fill in Great Salt Lake got another 5½ million tons of fill material for fast handling by the fleet of diesel-powered equipment in January when 2,138,000 lbs of explosive blasted off the face of a cliff at Little Rock, Utah. Morrison & Knudsen is the Contractor, and this famous firm owns around 3,000 diesel crawler tractors as well as draglines, scrapers, graders, compressors, trucks, loaders, etc., with diesel engines that make the firm one of the greatest heavy construction organizations in the world today.

MARSHALL, Sons & Co., Ltd., announces their M.P.6 diesel from their Britannia Works with Leyland U E 350/7 direct injection engine; C.A.V. injection and feed pumps, fuel filter, pneumatic governor and electric starter motor.

ENFIELD'S high speed air-cooled diesel with less than 200 lbs weight is aimed at the powering job on light tractors, grass driers, cultivators, mowers, hedge trimmers, ditchers, hammer mills and milking machines, says *Farm Implement & Machinery Review*. Aluminum is used extensively in its construction to get light weight with hp at 2.1 bhp at 1,000 rpm; 3.8 at 2,000 and 4.5 at 3,000.

AVELING & Barford, Ltd. won over hot international competition the big Argentina contract to supply motor graders and parts. The deal calls for 170 ten-ton motor graders and extra parts for road building, and is one of the biggest road equipment orders ever placed outside the U.S. It amounts to close to \$3,000,000 and puts this famous old British firm right in the world competition for the dirt-moving and road building business.

BRITISH tractor exports set a record in 1957 with a total of 114,965 valued at about \$165,000,000. Of these 3,391 went to the U.S. Massey-Harris-Ferguson, Ford and International Harvester were the big British manufacturers and exporters of tractors. David

Brown and Allis-Chalmers were also well up right behind the three leaders. David Brown plans to step up production 25% for 1958, and Allis-Chalmers states that 75% of its production is for overseas markets. Most of these British-built tractors are diesel powered.

DAVEY Compressor Co., Kent, Ohio, a pioneer in the tree surgery business, is offering a line of rotary drills mounted on GM and Cat diesel equipment for 1958. Cambria Drilling Co. of Crescon, Pa., recently cut time and costs on the site of the Veterans Rehabilitation Center near Johnstown, Pa., with its GM truck carrying GM diesel-powered drill. Davey's Model M-8TA is on Cat D8 new or used tractors that can go where trucks can't in rough terrain.

DEMAG Baggerfabrik GmbH in Germany is invading the U.S. heavy dirt moving field with an air-cooled diesel shovel. The Demag Universal Excavators in 1½ to 9 yard capacities are already busy in every corner of the globe.

POWERED by a 240 hp GM diesel, Yale & Towne is offering its Trojan tractor-shovel with Allison Torumatic transmission and Timken-Detroit planetary axles with a torque-proportioning differential. One of these units has just come into my home area on a bridge approach job. It has power steering and 4-wheel air brakes.

SHELL'S development in the Four Corners—the area where New Mexico, Arizona, Utah and Colorado meet—has a pipe line from its Aneth Oil field to Los Angeles that will be automatic, controlled by microwave from Los Angeles. Big crawler diesels are laying the pipe line following the scraping out of road from the old Indian trails by diesel-powered bulldozers and graders. Six companies joined hands to build this pipe line—Shell, Gulf, Standard of California, Richfield, Superior and Continental Pipe Line Corporation. Every major oil producing company in the U.S. is in the Four Corners now. It has become one of the hottest oil prospects in the world.

DIAMOND Gardner Corporation, formerly Diamond Match Co., has just published *California Heritage, A History of Northern California Lumbering*. It tells the Diamond Match story from its deepest roots, starting with the Gold Rush to come up from bull and he-man, water and gravity powers to steam, gasoline and the modern diesels that Diamond match powers its logging operations with today in its 200,000 acres of western Sierra slopes in the Sacramento River valley. Cat diesel tractors with bulldozers, Cummins-powered motor trucks for logging road building

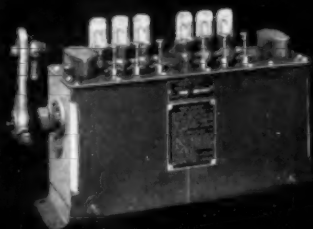
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## Manzel

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HOUSTON, TEXAS Specialists in metering pumps and lubricators since 1898

and hauling of logs respectively are featured. A modern plant is being built at Red Bluff to be operating before end of 1958.

JANUARY, 1958, construction on the National System of Interstate and Defense Highways was completed on 73 miles at a cost of nearly \$33,000,000. A total of \$3 billion has been authorized or actually spent for preliminary engineering, right-of-way acquisition and construction in the 19 months from July 1, 1956, to Jan. 31, 1958, says the U.S. Dept. of Commerce.

BALDERSON, Inc., Wamego, Kansas, is building a U-dozer and a push-dozer for the biggest diesel crawlers. Yancey Brothers, Atlanta, Ga., recently delivered one on a D9 to Lothridge Brothers Construction Co., Gainesville, Ga.

AUSTRALIA'S Tractor Testing Station, writes G. H. Vasey, Officer-in-Charge Tractor Testing at the University of Melbourne, is giving a few additional facts on the tractors tested than are found in Nebraska, British NIAE or German tests. "We use rated speed and full throttle for the maximum power tests, but for all other tests the engine runs under the control of the governor, set to give full throttle at rated speed," explains Vasey. "We also show the

graphs of belt performance: 1) torque/speed and power/speed over the whole range of performance, and 2) specific fuel consumption over the governed range of output." The Germans are also testing their tractors more or less after the famous Nebraska test but with a few variations.

HOWARD Rotavator has designed and built its rotary cultivator system for two sizes of International Harvester Co. tractors. Other models of the Rotavator have been designed for Allis-Chalmers, Case, Deere, Ferguson, Cockscht, Ford, Massey-Harris, Minneapolis-Moline and Oliver tractors.

#### Executive Staff Changes

Robert H. Daisley, Vice President-Administrative of Eaton Manufacturing Company, today was elected to the newly created position of Vice President-Planning, and William A. Mattie, General Manager of the Heater Division, was elected Vice President-Administrative to succeed him. The advancements were announced by John C. Virden, Chairman and President of Eaton. "Eaton recently adopted a long-range growth planning program which encompasses principally the areas of corporate acquisitions and new products," Mr. Virden said in his announcement. "In

his new position, Mr. Daisley will have the over all responsibility for carrying forward this program."

Mr. Daisley in 1922 joined the Wilcox Motor Parts & Manufacturing company, a predecessor of Eaton's Saginaw Division, advancing to sales manager in 1923. When this company became a part of the Saginaw Division, he was appointed sales manager and later general manager of that Division. In 1936, he was made general manager of the former Wilcox Rich Division and President of Eaton's Canadian subsidiary. He became a director of Eaton in 1941. In 1947, he was elected Vice President of the Company, and in 1954 Vice President-Administrative with supervision over all divisions outside of those in Michigan. The new Vice President-Planning was born in Brooklyn, New York.

He is a past president of the Automotive Parts Manufacturers Association, a trustee of the Automotive Safety Foundation, a trustee of the Cranbrook Foundation, and a member of the Society of Automotive Engineers and of the Detroit Engineering Society. Mr. Mattie has been a member of the Eaton organization since 1938 when he joined the Heater Division as plant superintendent. In 1953, he was made assistant general manager of this division and in the

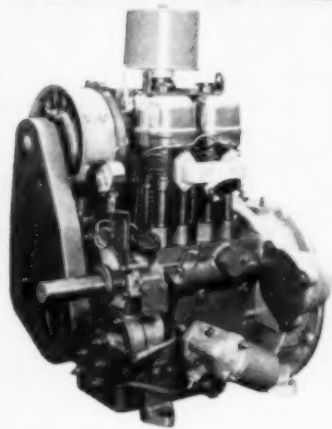
same year he was promoted to general manager.

#### Engine Bulletin

Two new diesel engines, Models D-344 and D-516, which Allis-Chalmers Manufacturing Co. recently added to its power unit line, are described in the 16-page catalog #BU-413 now available from the company's Engine-Material Handling Division, Milwaukee, Wis. Photographs, cutaways, charts and other illustrations help explain the operating and performance advantages of the two engines.

#### Product Line Booklet

Nordberg's complete product line is displayed in a recently published 12 page, three color brochure. The reference booklet contains a concise description and illustration of each major type of Nordberg built machinery. Photographs of the manufacturing facilities at Nordberg's Milwaukee and St. Louis plants introduce the reader to the company. The latest designs of the Nordberg diesel, Dualfuel and spark-ignition gas engines are shown and the bore, stroke and horsepower range of each is given. Copies of Bulletin 271 are available free upon request to Nordberg Manufacturing Company, Milwaukee 1, Wisconsin.



Powered by a Petter  
12.5 HP PC2 engine



## INTRODUCING A NEW LIGHTWEIGHT AIRCOOLED DIESEL ENGINE

The PC, an addition to the current range of Petter engines, is manufactured in 1, 2, 3 & 4 cylinders at a continuous speed of 3000 RPM and a horsepower rating of 6.25 per cylinder.

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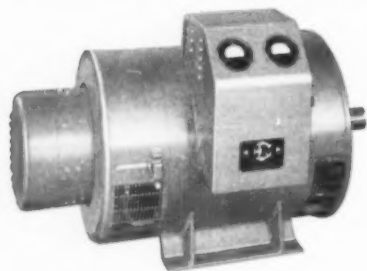
34-14 58th St., Woodside, N.Y., DEfender 5-7100

## Michigan-Ohio News

By Jim Brown

V. N. GREEN & Company of Charleston, W. Va. has accepted delivery on a model 6031-C GM Detroit diesel engine for their Cedarapids Rock Crusher. The sale was made by Ray C. Call, Inc. of Steubenville, Ohio.

### Power on tap! A NEW 5 TO 50 KW "PACKAGED" GENERATOR REG-AMP



REG-AMPS are available for 1800 and 1200 rpm operation, single- or 3-phase power, at all standard low voltages. REG-AMP shown has single bearing. Two bearing units are also offered.

**It's a complete source of a-c electric power and the perfect mate for your engine**

REG-AMP is a revolving field a-c generator with direct-connected exciter, built-in automatic voltage regulator, and a-c ammeter and voltmeter. It's factory assembled, internally connected, and tested.

**Regulates voltage automatically.** Simple relay constantly senses output voltage and keeps it right for best operation of your motors, lights, and electronic equipment.

**Positive voltage control.** Voltage can be adjusted to compensate for line voltage drop or normal engine speed droop under heavy load.

**Starts big motors fast!** Coordinated regulator design gives quick response.

**Easy to install, simple to operate.** Fully self-contained. Requires no switchboard. Merely couple to engine and connect to load thru suitable switch.

**Needs little maintenance.** Only an occasional check for cleanliness and brush wear.

**Fabricated steel frame.** Rigid, drip-proof frame keeps REG-AMP safe, clean, and dry.

**Performs smoothly.** Every design is painstakingly engineered. REG-AMP is a product of 50 years of E-M Generator experience.

Get more information from your nearby E-M Sales Engineer. Also, write E-M for publication PRD-246... it gives complete REG-AMP ratings.



**ELECTRIC MACHINERY MFG. COMPANY**  
Minneapolis 13, Minnesota

Largest manufacturer of "Packaged" Generators

HILL Crawford of Detroit has just accepted delivery on a model 800 Case Terratractor equipped with front end loader and powered by a Continental HD-277 diesel engine rated at 63.2 hp. Mr. Crawford purchased the Terratractor from J. R. Panelli Co. of Detroit.

AN Allis Chalmers model HD 21AC tractor equipped with a 21BD hydraulic blade was recently sold to James E. Mead of Brooklyn, Michigan by Earle Equipment Co. of Detroit.

JAMES C. Caruth & Sons, of Bridgeport, Ohio have a new 175 hp model JT-6-B Cummins diesel for their White truck. The engine was purchased from Cummins Diesel of Northern Ohio, Inc., located at New Philadelphia, Ohio.

GENERAL Motors Corporation of Detroit has announced that they will have two diesel exhibits on display at the Brussels Universal and International Exhibition of 1958, which will open on April 17, 1958. The first exhibit consists of a 100-ton Electro-Motive locomotive powered by a 1750 hp GM diesel. In the second exhibit are two of the world's largest road building machines, a twin-engine scraper and a huge crawler tractor built by Euclid Division of GM, and powered by Detroit diesel engines, which will give World's Fair visitors a close-up look at the tools which are constructing tomorrow's highways.

ED C. LEVY Co., of Detroit has recently purchased from Contractors Machinery Co. of Detroit a Model 21 Murphy diesel electric set rated at 107 kw. The Murphy engine drives an Electric Machinery Amp-Pak alternator which is installed in a hermetically sealed trailer. The electric set will be used to provide power for a new portable crushing plant.

ADVANCE Glove Co. of Toledo, Ohio are repowering the first of a fleet of International 190 tractors, replacing a gasoline engine with a JT-6-B Cummins diesel. Cummins Diesel Michigan, Inc. of Dearborn, Mich., who made the installation, has announced that the JT-6-B has undergone a successful trial and that plans are to convert the rest of the fleet from gasoline to Cummins diesels.

J. R. PANELLI Co. of Detroit has recently delivered a Worthington portable rotary-type air compressor (model 210) powered by a GM model 4051 2-cycle Detroit Diesel engine to the City of Detroit.

ALLIS Chalmers has a new type crawler-tractor this year, featuring a "long" track. Phelps Supply Co. of Bloomfield, Mich. has accepted delivery on one of these, a model HD6E equipped with a

6BE hydraulic dozer blade. The sale was made by Earle Equipment Co. of Detroit.

CYRIL J. Burke Inc. of Detroit has recently delivered to Dryer Bros. of Saginaw, Mich. an OC-126 Oliver 11½ yd front end loader powered with a 6-cylinder Hercules model D1XC 63 hp engine.

M. L. LEGG of Roscommon, Michigan has just converted a gasoline powered model D-70 Mack Tandem truck with a model NT-6-B Cummins 250 hp diesel. Mr. Legg will use the truck for a lumber operation in Roscommon. The engine was purchased from Cummins Diesel Michigan Inc. of Dearborn, Mich.

WOLVERINE Tractor and Equipment Company of Detroit and Grand Rapids has announced the appointment of a new salesman for the down-river communities in Detroit. His name is Bob King, and he comes to Wolverine with

6 years of experience as a sales engineer in industrial and construction equipment.

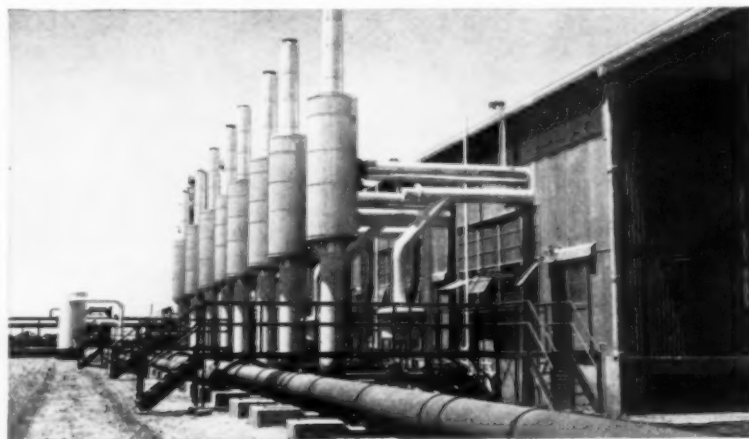
LOUIS Toccalino & Sons of Detroit have accepted delivery on a model 6 Northwest 13¼ yd pull-shovel powered by a model 20 Murphy diesel. The sale was made by Cyril J. Burke, Inc. of Detroit.

CUMMINS Diesel Michigan Inc. announces that Hadder Trucking Co., Inc. of Six Lakes, Michigan has just contracted to convert 5 gasoline powered IH tractors with model JT-6-B Cummins diesels.

GENERAL Telephone Co. of Ludington, Michigan has accepted delivery on a 55 kw model 3150 GM Detroit Diesel standby generator set. The sale was made by Peninsular Diesel Inc. of Detroit.

RANSON Pearch of Climax, Michigan

## SILENCING AT ITS BEST-WITH SOMETHING EXTRA



Many things affect the design and performance of silencing equipment. It takes experience to discern, classify and screen these influencing factors. The "extra" in every Maxim installation is this: it is based on an evaluation by specialists with unequalled experience in noise suppression.

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## THE MAXIM SILENCER COMPANY

Subsidiary of Emhart Manufacturing Company

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DIESEL PROGRESS

has purchased an Allis Chalmers model HD 16DC crawler tractor with the new "long track". The crawler is equipped with a model 16 BD hydraulic dozer and was sold by Earle Equipment Co. of Detroit.

A MODEL 6 Northwest 13½ vd pull shovel powered by a 149 hp model 20 Murphy diesel was recently delivered to Ponti Construction Co. of Detroit by Cyril J. Burke Inc. of Detroit.

CLARK Equipment Co. of Jackson, Michigan has just purchased a model NTO-6-IP Cummins diesel from Cummins Diesel Michigan Inc. of Dearborn, Michigan. The 262 hp engine will be used as a power unit in testing Clark Equipment's model R-600 transmission and model C-600 torque converter.

PENINSULAR Diesel Inc. of Detroit is installing a Model 4057C GM Detroit diesel engine in a Model 118 Galion Grader for Klett Construction Co. in Hartford, Michigan.

A UNIQUE installation job was recently completed by Peninsular Diesel Inc. of Detroit. For powering a Hough model HU Payloader they installed a model 3057C GM Detroit Diesel engine. The installation work was done for Ray Welch of Allen Park, Mich.

### Lightweight Engines Purchased

A contract totaling \$160,000 has been awarded American MARC Inc., California manufacturers of Diesel engines and generators, Denis Kendall, president, announced recently. The contract was placed by O'Keefe & Merritt for 268 light-weight, aircooled, 6 hp diesel engines. The engines will be used to power generator plants for the U.S. Marine Corps.

### Executive Vice-President Named

The White Motor Company board of directors broadened the company's management base by electing Henry J. Nave, president of The White Motor Company of Canada, Limited, to the position of executive vice-president with headquarters in Cleveland. Mr. Nave's appointment has been announced by Robert F. Black, chairman of the board, and John N. Bauman, president. The new position is part of an overall realignment of management functions at White made necessary by the growth of the company, and by the acquisition of three additional manufacturing divisions in recent years. The new executive vice-president has been with White since 1950. He has been president of White's Canadian affiliate, headquartered at Toronto, since 1955. In his

new position, Mr. Nave will be directly responsible for the administration of The White Truck Division located in Cleveland.

### Range of Couplings

Simms Motor Units Ltd. of Finchley, London, N.2. are manufacturing a range of flexible couplings suitable for fuel injection pump and exhaust drive and for general auxiliary applications. Constructed of steel throughout with an oil proof synthetic rubber insert, they are flexible, free from backlash and capable of taking up radial misalignment up to .010 in. according to Simms. The driving dogs are accurately machined in relation to the bores ensuring concentric rotation and the rubber insert which cushions the drive gives completely silent operation. The Fuel Pump Drive Coupling is adjustable to allow for timing the point of injection to the engine. The Exhauster Coupling is sufficiently robust to cope with the combined load of the exhauster and the fuel pump when driven in tandem. The Industrial Coupling for auxiliary drives is produced with a standard 1½ in. bore accurately positioned in both drive and driven halves to permit increase of the bore to the necessary dimensions by machining, the standard 1½ in. bore being used as a guide for this purpose. A variety of standard types suitable for a large number of popular diesel engines is available.

ITS NEW

### New Distributor Appointed

The Detroit Diesel Engine Division of General Motors has appointed Hicklin-GM Diesel, Inc., distributor of the Division's line of two-cycle diesels in Iowa and the eastern two-thirds of Nebraska.

The new distributorship also includes sections of Illinois and South Dakota bordering on Iowa. The distributor is a new corporation formed for the sale and service of Detroit Diesel's industrial, marine, and truck line of engines, exclusively. Heading the new company is Robert V. Hicklin, president. John B. Gilbert is business manager. Elmer E. Buwalda and Arvene D. Bocker head the parts and service departments, respectively. The business is presently located in Ankeny, Iowa on Highway 69 where parts and service facilities have been established. Work on a new building at a permanent location is underway in Des Moines at 5425 Second Avenue.

### Manager Of Marketing Planning

Paul Des Jardins has been appointed Manager of the new Product and Marketing Planning Department of Worthington Corporation, Harrison, New Jer-

sey. Des Jardins will be responsible for the planning and integrating of the marketing programs of all the separate product divisions of the corporation. Mr. Des Jardins graduated from Massachusetts Institute of Technology in 1938 and joined Worthington as an application engineer. Since 1954 he has been Manager of the Petroleum and Chemical Sales Department.

### Fuel Oil Additive Performance

The Du Pont Company reports that 520 worth of one of its chemicals added to a 50,000 gallon residual fuel oil tank at a power plant for one of its laboratories eliminated a six-in. accumulation of sludge in one week of operation with no equipment down-time. Savings in mechanical de-sludging and cleaning costs alone, the plant's power superintendent said, amounted to \$800. But, even more important, the chemical, Du Pont's Fuel Oil Additive No. 2, performed the clean-up operation while the

storage tank was in continual use, with boiler room operations completely trouble-free throughout the time the sludge was being dispersed chemically and burned with the oil. Being nonmetallic, the additive burned without leaving ash or other residue. In addition to sludge removal, Du Pont's Petroleum Chemicals Division pointed out, the fuel oil additive acts as a stabilizer, solubilizer, and dispersant in residual fuels and helps prevent sludge formation. It's usable in all types of distillate fuel oils, including blends such as catalytic-cracked stocks combined with straight-run products.

### Diesel-Electric Drilling Booklet

Four pages, photos, drawings, explain the advantages of the General Electric drive systems for electrified oil well drilling, include diesel engines that can be used with the systems. For this Booklet write General Electric, Schenectady 5, N.Y.

ITS NEW

## Murray & Tregurtha HARBORMASTERS solve tough marine power and steering problems!



Models from 40 to 400 h.p. (Series O-4 illustrated, 40-50 h.p., Gas or Diesel).

You can solve your tough power and steering problems with Harbormaster Outboard Propulsion and Steering Units . . . the complete heavy duty marine power packages. They are quickly and easily installed for immediate use. They are efficient, economical to operate and maintain . . . and they have many special features not found with ordinary marine power, so they are the answer to many tough marine problems.

If you need easily installed power, better steering control, safety in shallow water, easier maintenance, more efficient performance, simpler hull design, more cargo space, bigger payloads, or simplified crew operation . . . you should investigate the benefits of Harbormaster Outboard Propulsion and Steering.

Send for your copy of the new Harbormaster Catalog today. You'll find detailed information and also many interesting Harbormaster installation photos.

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Please send me New Catalog giving details and showing many photos of Harbormasters in action.

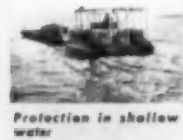
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Steer in any direction with full power



Easy service and low operating costs



Protection in shallow water



Rugged, trouble-free performance

## Inland River Reports

By A. D. Burroughs

THE surge in South American orders continues to swell inland river construction activities. A 3200 hp quadruple-screw craft has been completed by St. Louis Shipbuilding & Steel Corp. destined for South American service, operated by Compania Merdional DeMineracao, reportedly a subsidiary of US Steel Corp. The towboat is equipped with GM (Cleveland) engines.

TWO more diesel-powered tugs for South American service left the Louisiana Bollinger Machine Shop and Shipyard, going to Nicaragua, S. A., piggy-back style on three barges. The tugs measure 40 by 14 ft. with power for each tug supplied from a GM Model 6-71 engine.

TWIN Caterpillar D375 engines equip the Equitable Equipment Company Inc.

edition for South American service. The Louisiana firm delivered the 600 hp tug, measuring 60 by 21 ft. to Instituto Nacional de Canalizaciones. The tug is tagged as the *I.N.C.-A*.

*LOS COCOS*, a 92 ft 6 in. by 27 ft tug, is one more Equitable Equipment production for South America, delivered to Compania Ramrey Internacional with power supplied by Enterprise DMR38 engines.

AT Franklin, La., the Thirteen Drilling Co. christened their second inland drilling barge. The 155 by 50 ft barge is powered by three Waukesha diesel engines providing 1650 hp total.

TWO Model NRT-6M Cummins engines provide the rated 600 hp for the new towboat, *Challenger*. The 50 by 16 ft craft, designed by Luther Tarbox, is owned by Williams Towing Co., and is in service on the inland waterways along the Gulf coast.

CHRISTENING ceremonies for the new power package, the *Theresa Seley* brought out some 100 famous names from the river rosters paying tribute to the 200 ft towboat on the first inspection trip. Completed by Dravo for Seley Power Inc., the rated 6000 hp comes from twin Nordberg turbocharged engines, Model FS-1312-HSC. Other quality names on the equipment listing include DeLaval, Filcon, Elliott, Briggs, Gardner Denver, Coulds, etc.

ANOTHER new power package for inland river service is the *Crescent City*, purchased from the Dravo 3200-line by Sioux City & New Orleans Barge Lines Inc. The 148 by 34 ft towboat is equipped with two GM engines for the 3200 hp and will join the active Sioux fleet with the 1800 hp *Sioux City*, the 3200 hp *Kansas City*, the still-new *Waverly* with 1000 hp and the 1800 hp *Omaha*.

THE Missouri Boat and Machine Co., Cape Girardeau, Mo., completed final touches on a new 153 by 34 ft towboat. The vessel resembles the *E. E. Smith*, a popular 1956 production for Missouri-Illinois Barge Line Co., with 1800 hp from two GM engines.

FEDERAL Barge Lines, famous for push-power from the bigger towboats, has chartered the much-celebrated *Mark Eastin*, completed in 1957 by Nashville Bridge Co., for West Kentucky Coal Co. The 5600 hp is supplied by GM Model 16-498 engines.

A NEW batch of pictures came in on the big beauty, the lovely *Laura Lee*. The triple-screw towboat completed several months ago slipped quietly into service with three Fairbanks-Morse OP engines providing main propulsion power. With specially designed Kort nozzles, the St. Louis Shipbuilding & Steel Company's production is rated at 6000 hp.

ON THE waterways, the effect of the part-time coal and steel work-weeks appeared immediately; the traffic picked up as the weather conditions cleared. The *I. F. Freiburger*, owned by Island Creek, was making nice time on the Ohio with power from two Enterprise engines rated at 2560 hp.

UNION Barge Line's fleet was in action, and we saw the *Southern*, later spotted the *Western* near Mount Vernon, Ind. The *Western* was built by Dravo in 1956 and the 3500 hp comes from White's Superior engines.

THE *Queen City*, Ohio River Company's craft powered with Baldwin-Lima-Hamilton engines for 3240 hp was sighted with a good tow and making good time pushing seven loaded barges and 12 empties. The craft was a 1957

delivery from St. Louis Shipbuilding and Steel Company, and is named for Cincinnati, the "queen city" of the Ohio River.

THE *Carcosse* was a busy boat on the Illinois River. Built by St. Louis Ship in 1956 for Cargo Carriers, Inc., Minneapolis, the time-tested craft measures 150 by 33.5 ft. with reliable power for the rated 2400 hp from a pair of Cooper-Bessemer engines.

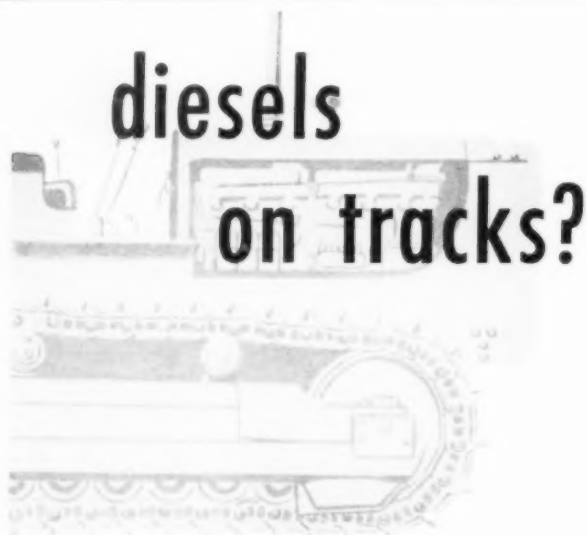
THE tempo was set for Upper Mississippi River transportation as the *La Crosse Socony* was marked the first in with the tow of petroleum reportedly some 5500 tons of petroleum products. GM engines supply the 3200 hp for this seven-year-old craft owned by Socony-Vacuum Oil Co.

THE GREAT Lakes Dredge and Dock Company took recent delivery of their new tug, *Volunteer State*, with 289 hp provided by GM 6-110's. The 45 by 12 ft tug was constructed in Louisiana by Equitable Equipment Co.

PHOTOGRAPHY fans were enthusiastic over the Allis-Chalmers display at the Mississippi Valley Association. Photos of the Allis-Chalmers-powered river vessels included the *Joey*, the *Shark*, the *Moss Bluff*, and the new *Arizona*.

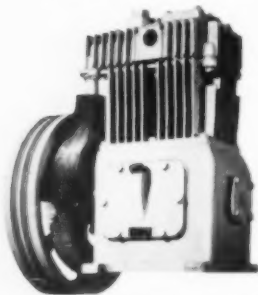
### Truck Manufacturers Combine

Kenworth Motor Truck Division of Pacific Car and Foundry Company, Seattle, Washington, has completed negotiations to purchase substantially all of the assets of the Dart Truck Company of Kansas City, Missouri. Dart Truck Company is a wholly-owned subsidiary of the Carlisle Corporation of Carlisle, Pennsylvania. The purchase was announced jointly by George F. Dixon, Jr., President of the Carlisle Corporation, and Paul Pigott, President of Pacific Car and Foundry Company. Rock and Ore mover operations of the newly formed KW-Dart Truck Company will headquarter in Kansas City. A new manufacturing and administrative facility will be constructed in the immediate future. R. D. O'Brien, Vice President and General Manager of Kenworth Motor Truck Company, is the president of the new company, but will continue also in his Kenworth position. Carrol J. Warrell, Vice President and General Manager of the Dart Truck Company, will continue in that position with the KW-Dart Truck Company. Personnel and staff of Dart at Kansas City will continue on with the new organization. When the new Kansas City building is completed, production of Kenworth's complete line of rock and ore moving trucks will be moved there from the West Coast, in addition to continued manufacture of the Dart line of



### another spot for Quincy compressors

A positively sealed, dust-proof crankcase is just one reason why Quincy Compressors take to this assignment. They're rugged all the way through—with an improved pressure lubrication system that signals the operator if oil is low! Service from coast to coast—complete selection from 1 to 90 C.F.M.



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equipment. Kenworth Motor Truck Company builds custom-engineered highway and off-highway trucks with gross vehicle weights rated between 33,000 lb and 110,000 lb. The Dart Truck Company, has been manufacturing heavy-duty, off-highway trucks in Kansas City since 1926. Their line of off-highway equipment is well known in the construction and mining industries, both domestically and abroad.

### Injector Valve Spring

The new Mighty Midget injector valve spring for General Motors diesel engines was designed as a premium replacement to resist premature breakage, and add pep to rebuilt injection units according to its manufacturer, A. G. Anderson & Co. of Chicago. This small spring plays an important part in these diesel engine systems. It must feed fuel into the combustion chamber at split-second intervals, hour after hour. To do this without weakening, and without appreciable loss of free length, compressed length, or tension, every stage of the spring's manufacture must be carefully controlled. In this new spring, the original tensile strength of 325,000 lbs in the steel wire used is preserved throughout the coiling process by an exclusive manufacturing technique, according to Anderson engineers. Free samples of this new spring along with literature and prices are available on request. Write A. G. Anderson & Co. 2111 South State Street, Chicago 16, Illinois.

**ITS NEW**

### Filter Equipment Catalogs

Illustrated, 2-color catalogs, describing and listing the complete 1958 line of filter equipment have been announced by the Fram Corporation, Providence, R. I., manufacturer of automotive and industrial filters. There are three catalogs: *General Products Catalog*, 16 pages; *Air Filter Catalog*, 36 pages; *Filter Specifications Catalog*, 76 pages. The *General Products Catalog* includes illustrations, diagrams, dimensions, rated flows, descriptions, etc., of oil, fuel and water filters, kits, lines, fittings, parts, brackets, gasket sets, etc. The *Air Filter Catalog* includes comparative charts on engine wear with Fram Filtronic air filters and with oil bath and oil wetted air cleaners, installation specifications, air flow requirements for trucks and industrial engines, methods for determining engine air requirements, complete listing of Fram Filtronic Air Filters and Cartridges, adaptor kits, installation fittings, typical installations and air flow curves. The *Filter Specifications Catalog* includes oil and air filter cartridge cross reference, foreign vehicles cartridge cross reference, replacement cartridges for factory installed filters including

foreign vehicles, filter installations specifications for passenger cars and trucks and principal applications of popular Fram oil cartridges. Copies of these 1958 catalogues and/or additional information are available by contacting the Fram Corporation, Providence 16, R. I.

### High-Speed Synchronous Generator

Redesign of its high-speed synchronous generators in single bearing units for internal combustion engines, close-coupled to standard SAE flanges, or in two-bearing units for belt drives or direct connection has been announced by Allis-Chalmers. Available in ratings from 30 through 150 kw at 1800 rpm and 50 through 300 kw at 1200 rpm, the high-speed synchronous generators feature an improved exciter located inboard of the bearing to provide a shorter, lighter, more compact machine. The generators are equipped with oversize grease-lubricated ball bearings, which eliminate the need for oil filters and sight gages. A rigid rolled steel yoke and cast iron housings provide a solid bearing support for extended bearing life and protection against mechanical damage. The generators' 12 leads permit a wide choice of voltages. An extra-large conduit box provides ample space for making connections.

Other features of the redesigned generators include field poles dovetailed to the shaft, damper windings diecast in the face of the rotating field pole to assure good generator paralleling characteristics, and easily accessible brush holders. Allis-Chalmers high-speed synchronous generators meet NEMA, MEE and ASA standards. Units are also available to meet ABS and AIEE, Section 45, as well as Marine and Lloyds of London specifications. The generators are available with Class A or B insulation to meet various ambient temperature ranges or with special insulation materials which provide stability at high temperatures, resistance to abrasion and moisture protection. These new generators are described in a new bulletin released by the company. Copies of the new bulletin, 51B8909, are available on request from Allis-Chalmers, Milwaukee 1, Wisconsin.

### Bulletin on Marine Diesels

A 12-page catalog (Bulletin #112) covering performance data, features, and specifications of their Model 60 and Model 80 Superior marine diesels has been issued by the White Diesel Engine Division, Springfield, Ohio. Included are two pages of charts on the potential of heavy fuel operation and the performance curves of these vertical in-line models. Charts show over 25% more

power for the same space requirements due to internal improvements and White's supercharging system. Illustrations detail the engine styles and such construction refinements as the quick reversing feature, simple cylinder block design, open chamber combustion system, and heavy duty components. Complete specifications and dimension information are given. Free copies of Bulletin #112 are available from the Advertising Dept., White Diesel Engine Division, Springfield, Ohio.

### Fuel Injection Firm Purchased

In a joint statement Don S. Connor, president of Micromatic Hone Corporation, Detroit, Michigan, and Boyd S. Oberlink, group vice president of Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin, announced the sale of certain assets of Micromatic's Micro-Precision Division in Evanston, Illinois, to Allis-Chalmers on February 28, 1958. Under the terms of the sale Allis-Chal-

mers has acquired all the machinery, equipment, inventories and patents relating to the diesel operation. Micro-Precision has been engaged in the manufacture of diesel fuel injection systems under certain patents, and custom aircraft components. The aircraft activities have been transferred to Micromatic's Los Angeles division. All elements in the purchase will be transferred to the Allis-Chalmers plant in Harvey, Illinois. Micromatic Hone Corporation will retain ownership of the Micro-Precision plant and real property at Evanston until disposed of.

**HERE IS IMPORTANT INFORMATION!** The completely new 1958 edition of the **DIESEL ENGINE CATALOG**, Volume 23, is now available. If you design, purchase, sell, operate or service diesel, dual fuel or gas engines, the Catalog is essential to you. This giant, 400 page, 10 1/2" x 13 1/2", fully illustrated reference book has been revised, rewritten and brought up to date completely from cover to cover. Send your order in now for this limited edition, which costs \$10 postpaid plus California sales tax where applicable. Send checks or company orders to **DIESEL ENGINE CATALOG**, 816 N. La Cienega Blvd., Los Angeles 46, Calif.

## lower initial cost lower service cost

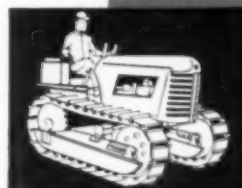
Compare and you will see the ROOSA MASTER fuel injection pump costs less. Use it and you will see that your service costs less. There are fewer parts to service and repair because of the unique design of ROOSA MASTER. It takes less space on your engine, and weighs less than 10 pounds. Even though small in size and light in weight one size serves either a 2, 3, 4, 6 or 8 cylinder engine.

**HMS**

**ROOSA MASTER**

*makes  
good  
diesels  
better*

HARTFORD MACHINE SCREW CO., HARTFORD 2, CONN.  
DIVISION OF STANDARD SCREW COMPANY



The result of 17 years of engineering development is proven in hours and miles of outstanding performance.



YOU CAN DEPEND ON THE DIESEL THAT DEPENDS ON ROOSA MASTER

**NO LUBRICATION**  
**NO MAINTENANCE**  
**NO WEARING PARTS**

Specify  
**THOMAS**  
 ALL METAL  
**FLEXIBLE COUPLINGS**  
 FOR MAINTENANCE FREE  
 POWER TRANSMISSION  
 on PUMP, COMPRESSOR,  
 MARINE and  
 OTHER DRIVES



DBZ — for high speed, heavy duty drives

Thomas' 40 years of flexible coupling experience is at your disposal to help you meet ordinary applications or special variations for unusual cases.



FLOATING SHAFT  
 BMR — for heavy duty service with excessive misalignment



SINGLE FLEXING  
 SS — for engine-driven generator sets with out-board bearings



DOUBLE FLEXING  
 AMR — for engine and medium speed drives

UNDER LOAD and MISALIGNMENT  
 ONLY THOMAS FLEXIBLE COUPLINGS  
 OFFER ALL THESE ADVANTAGES.

- 1 Freedom from Backlash  
Torsional Rigidity
- 2 Free End Float
- 3 Smooth Continuous Drive with  
Constant Rotational Velocity
- 4 Visual Inspection While  
in Operation
- 5 Original Balance for Life
- 6 No Lubrication
- 7 No Wearing Parts
- 8 No Maintenance

Write for Engineering Catalog

**THOMAS FLEXIBLE  
 COUPLING CO.**

WARREN, PENNSYLVANIA, U. S. A.

## B-L-H General Manager

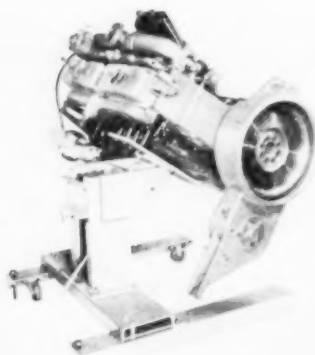


William F. Boyle

White, chief engineer at Pelton, has been elected a vice president of the corporation, and named to succeed Boyle as Pelton general manager. Boyle, who has been in charge of B-L-H West Coast operations, an assignment also encompassing the corporation's Madsen Works, La Mirada, Calif., will succeed Walter A. Rentschler at Hamilton. Rentschler has resigned as Hamilton general manager to devote full time as President to The Citizens Savings Bank & Trust Company in Hamilton. He remains, however, a vice president of B-L-H. No changes in products or policy and no further changes in personnel are planned at the Pelton or Hamilton Divisions, the corporation stated at the home offices in Philadelphia. Boyle, who has been a vice president and general manager at Pelton for 13 years, is a native of Brooklyn, N.Y.

He was educated at Pratt Institute in Brooklyn where he obtained a degree in industrial mechanical engineering in 1927. He joined Westinghouse in East Pittsburgh, Pa., was later transferred to the company's Steam Turbine Division in Essington, Pa. He became coordinator of gas turbine activities at the Essington plant and then sales manager there of the Jet Engine Division. Boyle left Westinghouse in 1945 to become a vice president of Baldwin-Lima-Hamilton and general manager of the Pelton Division.

## Universal Engine Stand



The development of a new, convenient Universal Diesel Engine Stand has been announced by Kent-Moore Organization, Inc. The manufacturer states this Stand has been released only after months of trial and field testing in cooperation with leading engine and equipment manufacturers. A large capacity hydraulic pump lifts the side mounted engine to a horizontal position and it can be raised or lowered to convenient working height.

All hand-cranking has been eliminated. The Stand features one man operation and will handle the

largest automotive type diesel engines. Using tapered roller bearings, oilite bearings and structural steel the stand is engineered for long, trouble-free service. A complete line of adapters are available. For additional information and prices write Kent-Moore Organization, Inc., 28635 Mound Road, Warren, Michigan.

(ITS NEW)

## Vice President Named



Leo J. Troutz

Ken W. Davis, president of Cummins Sales and Service, Inc., Fort Worth, announced recently the appointment of Leo J. Troutz as Vice President of Cummins Sales & Service de Venezuela, C. A. This company distributes and services Cummins diesel and Turbodiesel engines in Venezuela for petroleum, transportation, marine, industrial and other power applications. General office for Cummins Sales & Service de Venezuela, C. A., is in Caracas. In addition, it has maintenance shops and sales points in Caracas, Maracaibo and Anaco. Troutz will continue as General Service Manager of Cummins Sales & Service, Inc., Fort Worth, and divide his time between the two organizations. He has been with the Fort Worth company since 1943.

## New Filtration Equipment

Filtration down to 2 microns, resulting in assured removal of solid contaminants down to .30 milligrams per 100 cc of fluid, is now offered through the use of its new Micronetic Filters, according to Engine Life Products Corporation of El Monte, California. Engine Life's engineering department states that 2-micron filtration and .30 milligrams per 100 cc of fluid respectively have been proved both qualitatively and quantitatively by one of the nation's major missile manufacturers, in the operation of hydraulic test stands, hydraulic power, supply and hydraulic ground handling equipment to the extent that the manufacturers of this equipment have written Engine Life Filters into original specifications. The importance of proper filtration techniques was emphasized by the company



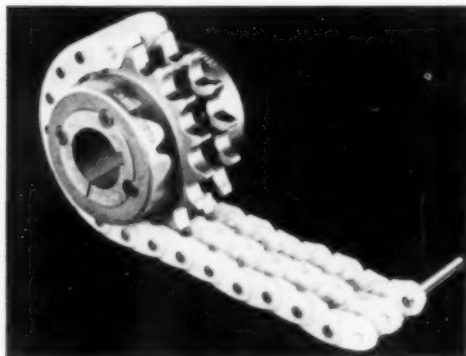
in announcing these results. Engine Life's engineering department has developed specialized technical data and filtration procedures for the following fields: aircraft, industrial, automotive and truck, marine, agricultural, and construction. This

**DIESEL PROGRESS**

information is available free upon request. Write Engine Life Products Corporation, El Monte, California.

ITS NEW

### Flexible Nylon Coupling



The addition of a new, lubrication-free nylon coupling to its line of flexible couplings has been announced by Morse Chain Company, Ithaca, New York. Corrosion-resistant, the chain element of the new coupling is constructed of nylon segments and stainless steel pins. It can be disassembled or connected at any link without special tools, and fits standard, stock steel roller chain sprockets. The new coupling needs no protective cover, handles loads from fractional to 40 hp and speeds from 500 to 5000 rpm. Complete couplings (1½ in. pitch links and soft steel sprocket), or chain elements are available, at a cost of about 20% less than their all-steel counterparts, the manufacturer reports. For more information, write: Mr. Frank Wood, Morse Chain Company, Ithaca, New York.

ITS NEW

### Sales and Engineering Appointments



V. L. Snow

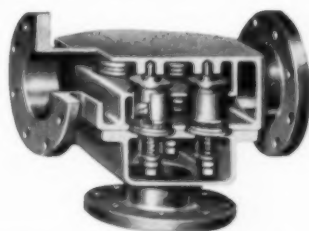


G. M. Perry

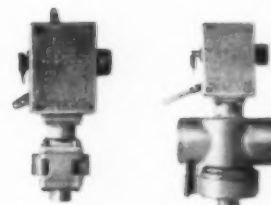
R. Q. Armington, General Manager of Euclid Division, General Motors Corporation, has announced the following appointments in the Sales and Engineering Departments. George M. Perry is appointed Director of Sales, after spending the past five years as first, Works Manager and then Managing Director of Euclid's manufacturing subsidiary in Glasgow, Scotland. Prior to his assignments overseas, Mr. Perry, with Euclid since 1946, served as Assistant Export Manager and Service Manager. He will be responsible for all sales activities, liaison with General Motors Overseas Operations and will retain his position on the Board of Directors of Euclid (Great Britain) Ltd. V. L. Snow becomes Director of Engineering and will assume responsibility for all aspects of product engineering. Mr. Snow, with Euclid since 1935, has successively been Assistant Chief Engineer, Manager of Industrial Products, Manager of Sales Development, Domestic Sales Manager and Director of Sales.

MAY 1958

## AMOT ENGINE CONTROLS



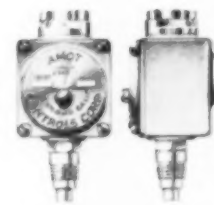
**THERMOSTATIC VALVES**, for jacket water and lube oil temperature control. Self-contained, modulating, use no external bulbs. Sizes 1½" to 6". Temperature settings 75°F to 195°F.



**MECHANICAL SAFETY CONTROL VALVES**, used to shut down engines and compressors in event of oil pressure failure, overspeed, overheating of jacket water or lube oil, etc.



**VENTED GAS VALVE**, diaphragm operated will shut off the fuel gas and vent the manifold when used on internal combustion engine applications. Made in 2", 3" and 4" sizes.



**SAFETY CONTROL SWITCH** will flash warning signal, sound an alarm or close a solenoid fuel valve on overheating of jacket water or lube oil, or pressure failure of lubricating system.

**AMOT CONTROLS CORPORATION** • FIRST ST. & NEVIN AVE. RICHMOND, CALIFORNIA

### MV "LADY ROSE-MARY"



**BRIGGS FILTERS PROTECT THE TWO 1230 BHP DIESELS ON THE MV "LADY ROSE-MARY", THE NEW INLAND OIL AND TRANSPORT VESSEL BUILT BY NASHVILLE BRIDGE COMPANY**



### WRITE FOR FREE MARINE DATA BULLETINS COVERING:

- ONE PASS, ONE TANK FILTRATION AND SEPARATION
- LATEST INFORMATION ON IMPROVED FUEL AND LUBE OIL FILTRATION
- IF YOU USE COMPRESSED AIR, BY ALL MEANS GET OUR FOLDER SHOWING METHODS FOR MAINTAINING WATER-FREE AIR.

THE BRIGGS FILTRATION COMPANY  
DEPT. 243, WASHINGTON 16, D.C.

**YES!**

SEND ME INFORMATION ON THE FOLLOWING

- ☐ ONE PASS FILTRATION/SEPARATION
- ☐ FUEL AND LUBE OIL FILTRATION
- ☐ DRY COMPRESSED AIR

NAME .....  
COMPANY .....  
ADDRESS .....

## Mid-Continent Diesel News

By Jack F. Cozier

PROGRESS Construction Co., Claremore, Okla., purchased a TS-24 twin Euclid scraper with a GM 6-110 diesel engine on the front and a GM 6-71 die-

sel engine on the back from Butler Sparks Equipment Co., Tulsa, Okla. The unit will be used for earth moving at Fort Leonard Wood, Mo.

RIO DE ORO Uranium Mines, Inc., Grants, New Mexico, bought a 350 kw Caterpillar D-397 diesel electric set with switchgear for power in the mine from Hoover Equipment Co., Oklahoma City, Okla.

AMERICAN Bridge Division, U. S. Steel Corp., Pittsburgh, Penn., has purchased a Fairbanks, Morse 525 hp, seven cylinder, model 38F51 $\frac{1}{4}$  diesel engine.

ALAMO Express, San Antonio, Texas, operates 31 International tractors all powered by Cummins HRFB-600 diesel engines. This motor freight line covers the Southern part of Texas.

J. E. CARLSON, Inc., Hutchinson, Kan., has bought a Cleveland model 140 trencher powered by an International model UD-350 diesel engine from Leland Equipment Co., Tulsa, Okla.

PHILLIPS Petroleum Co., Bartlesville, Okla., purchased a Caterpillar D-318 diesel electric set from Hoover Equipment Co., Oklahoma City, Okla., for an offshore drilling platform.

BILL Allen, Wilburton, Okla., coal operator, bought a model 1250 Lima dragline from R. A. Young & Son, Inc., Tulsa, Okla. The unit is powered with a GM6-71 diesel engine with an Allison torque converter and will be used for coal stripping.

CITY OF Bloomfield, Iowa, has purchased a Fairbanks, Morse 1900 hp, six cylinder, model 31AD18 dual fuel generating unit.

BURTON Construction & Shipbuilding Co., Port Arthur, Tex., has bought four Caterpillar D-337F marine diesel engines and four D-311 diesel electric sets from Hoover Equipment Co., Oklahoma City, Okla. The engines will be used in two workboats.

CAMDRIIL International has in operation an Ideco rig in Libya under contract to Socony Mobil Oil Co., Inc. The rig is powered with four Cummins VT-12 turbodiesel engines and has the electricity supplied by two Cummins NHIP-600 diesel engines driving two 60 kw Electric Machinery generators.

CITY OF Butler, Missouri, purchased a ten cylinder Fairbanks, Morse model 33FD16, 2000 hp dual fuel generating unit.

OIL Well Supply Co., Oklahoma City, Okla., bought a Caterpillar D-337F die-

sel unit from Hoover Equipment Co., Oklahoma City. The unit is rated at 190 hp @ 1600 rpm and will be used to power a Gardner-Denver mud pump.

### Diesel Truck Sales

John P. Caro, president of Caro Motor Sales, has announced the purchase of 40 more Mack diesel tractors, bringing the company's fleet of Mack diesels to 108 units. The firm transports freight in the Eastern United States under lease to Kramer Brothers, a Detroit trucking concern.

Sale of 10 big diesel-powered concrete mixer trucks, valued at \$171,650, to the Silver Hill Sand & Gravel Co., Washington, D.C., was also announced recently by Mack Trucks, Inc.

### High Capacity Valve

A new, single-stage pressure regulating and shutoff valve, with precision control at high capacity, has been developed by The Garrett Corporation's AiResearch Industrial Division, Los Angeles. Featured by simple, direct operating and regulating action, the two-inch in-line valve was developed originally for pressurized transfer of liquid oxygen and fuel to missiles. It is suitable for gases such as helium, air, oxygen or

nitrogen and may be used in many applications where tight shutoff with minimal overshoot on dead end service is needed. The responsive and accurate AiResearch valve reduces pressures from as high as 3500 psi to 10 to 250 psig. Gas flow rates to 30,000 scfm are passed through concentric body passages. In pressure reduction the valve is normally accurate to  $\pm 2\%$  of the maximum range required, but can be modified to an accuracy of  $\pm 1\%$  if desired. Typical inlet temperature capabilities spread from -250 to 250 degrees F. In the event of diaphragm failure, the valve moves to the closed position. It may be equipped to shut down in less than 0.1 second.

ITS NEW

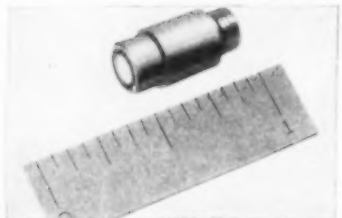
### Huge Motor Tankers

Chantiers de l'Atlantique (Penhoët-Loire) are building some of the world's largest motor tankers, as, according to a report from the federation of French shipyards, this yard has on order six super tankers, each of 46,500 tons d.w. They will all be single screw ships equipped with B&W diesel engines built on license by Chantiers de l'Atlantique. The engines will have twelve cylinders and are to be fitted with turbocharge so as to be capable of developing 15,000 bhp. By these means the ships will obtain a service speed of 16 knots.

### NEW PRODUCT NEWS



Model PZ-14



Model PZ-6

## Kistler Gages Measure Engine Knock and Detonation Pressures

Quantitative measurements of pre-ignition, detonation, and other abnormal combustion pressures can now be made under the most severe engine operating conditions with the new Kistler SLM Electronic Pressure Gage. Designed to measure either pressure or pressure rate *directly*, the one basic Quartz Gage (Model PZ-14) also indicates compression, peak firing, manifold and fuel injection pressures.

Unlike the familiar mechanical-type pressure gage where an indicator needle moves back and forth, the Swiss-made SLM Electronic Gage presents a dot moving up and down on a TV-like (oscilloscope) screen. It shows *pressure at any instant*, and not merely peaks or averages. Thus the effect on cylinder pressure of valve and port operation, ignition, combustion, or timing can be readily observed. Extremely high sensitivity permits even minor variations in cylinder pressure to be greatly magnified and examined in detail.

The new SLM Sub-Miniature Pressure Gage (Model PZ-6) equipped with a specially adapted spark plug permits cylinder pressure measurements in unmodified internal combustion engines.

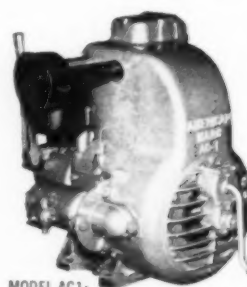
A new console model which includes associated Kistler Pre-Amplifier-Calibrator units, electronic switches and oscilloscopes, displays up to eight cylinder pressure signals simultaneously. Simple gang connectors (summing units) permit eight pressure rate signals to be superimposed on the screen.

For manufacturing test, training, field engineering, field maintenance and service applications, the new portable SLM Engine Indicator-Analyzer is the most advanced equipment developed. Unlike conventional engine analyzers which show only ignition or vibration patterns, this Kistler package provides precision measuring instrumentation that fits readily into established maintenance procedures. For complete information, request Bulletins EA-114 and S-114.

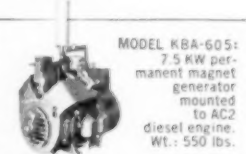
Kistler Instrument Corp., Dept. DP, 15 Webster St., North Tonawanda, N. Y.

## LIGHTWEIGHT CHAMPIONS

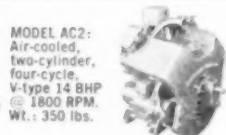
by America's largest manufacturer  
of AIR-COOLED DIESELS



MODEL AC1:  
Air-cooled, one-cylinder, four-cycle.  
6.5 BHP @ 1800 RPM. Wt.: 220 lbs.



MODEL KBA-605:  
7.5 KW permanent magnet generator mounted to AC2 diesel engine. Wt.: 550 lbs.



MODEL AC2:  
Air-cooled, two-cylinder, four-cycle, V-type 14 BHP @ 1800 RPM. Wt.: 350 lbs.

AMERICAN MARC Inc. is the acknowledged leader in the field of lightweight, air-cooled diesel prime movers for all uses requiring 6.5 to 15 BHP. Prominent in the American MARC line is the new permanent magnet generator, available from 3 to 7.5 KW output. (AC or DC, and industrial three-phase). American MARC also manufactures rotating armature generators, refrigeration power units and diesel pumping units of various capacities for industrial and marine installations.

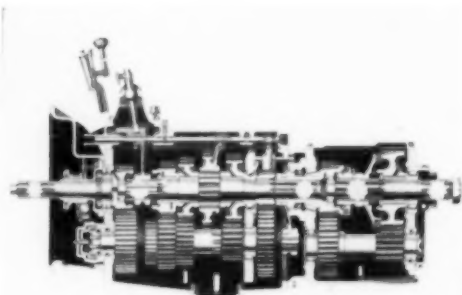
### AMERICAN MARC INC.

#### DIESEL ENGINES

1601 West Florence Ave.  
Dept. D-38

Inglewood, California  
Telephone OR 8-7174 6-104

## Heavy Duty Transmission



Production of a heavy-duty semi-automatic transmission designed specifically for big earthmoving and mining equipment has been announced by Fuller Manufacturing Company, Kalamazoo, Michigan. Called the R-1550 RoadRanger Transmission, the model is rated for engines up to 1550 cu in. displacement producing up to 600 hp. It features nine forward ratios, with direct drive in eighth gear, and two reverse ratios with all controlled by one gear shift lever. Gear shift steps are short and even, averaging 38 per cent between ratios. This transmission features quick, easy shifts. There is no gear splitting. The nine selective gear ratios are evenly and progressively spaced, permitting engines to operate in their peak horsepower range, for maximum fuel economy. Range shifts are pre-selected, automatic and synchronized. For further information on the R-1550 RoadRanger transmission, write Fuller Manufacturing Company, Transmission Division, Kalamazoo, Michigan.

## Milling Machine Weighs Pistons

A new Snyder milling machine that automatically removes material from diesel engine pistons in accordance with a precision weight measurement has been designed and built by Snyder Tool & Engineering Co., 3400 E. Lafayette Ave., Detroit 7, Mich.

A weight tolerance of plus or minus 0.02 lb is maintained in the milled parts. The machine is designed to handle 4 3/8 in. dia. aluminum or cast



iron pistons as well as 3 3/8 in. dia. aluminum pistons of varying designs and weights. To enable a milling cutter on the machine to remove metal from the cast iron and aluminum parts at optimum

surface speed, a two-speed 600 and 1,800-rpm motor is provided for the spindle drive. A built-in memory device in the electrically-controlled machine automatically sets the depth of cut of the milling cutter based on readings of the precision electronic weight scale. Overweight parts outside the blueprint specifications are automatically cancelled from the memory circuit. Hydraulic cylinders powered by an external hydraulic pump and tank unit clamp the part for the milling operation, feed the spindle and make the automatic feed depth adjustments. A coolant system is provided for machining the aluminum parts. Net production rate is 261 pieces per hour for aluminum pistons and 192 pieces per hour for cast iron pistons.

(ITS NEW)

## Director of Research



Dr. Karol Pilarczyk

De Laval Steam Turbine Company, Trenton, N. J., has announced the appointment of Dr. Karol Pilarczyk as Director of Research and Development. The staff of the Research and Development program has been increased for an expanded research program. W. H. Wiebe remains Chief Research and Development Engineer and H. W. Ebeling Superintendent of the Engineering Laboratory.

# Oil Filter and Cartridge for DIESELS

## New DELUXE HL-HS GRADUFLO OIL FILTER AND CARTRIDGE

MAXIMUM ABSORPTION ABILITY

GREATER LOADING CAPACITY

FULL-DEPTH OIL CLEANSING

LONGER LIFE

DELUXE FILTER DESIGN SETS NEW STANDARD  
FOR DIESEL LUBE OIL FILTRATION

"ALL-WEATHER" RELIEF VALVE LETS  
OIL WARM UP QUICKLY...EFFICIENT  
FILTRATION STARTS SOONER

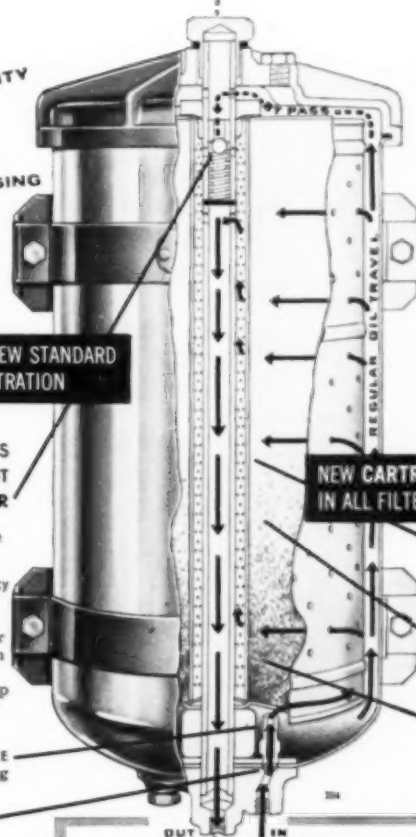
- ✓ Reduces Excessive Internal Pressure
- ✓ Prevents Cover Gasket Leakage
- ✓ Promotes Greater Cartridge Efficiency

This exclusive DeLuxe relief valve insures uniform pressure inside filter ... prevents cold unfilterable oil from entering the cartridge, directing it back to the crankcase for fast warm-up ... cartridge contaminants cannot be squeezed back into oil stream.

REMOVABLE METERING ORIFICE lets oil enter filter without agitating accumulated sludge

CHECK VALVE PREVENTS DRAIN BACK

CAPACITY:  
Model HS (2.75 GALS) 500 cu. in.  
Model HL (3.50 GALS) 750 cu. in.



NEW CARTRIDGE IMPROVES PERFORMANCE  
IN ALL FILTERS OF 500-750 CU. IN. CAPACITY

STAPLE COTTON FIBRES absorb 5.25 times their own weight in contaminants—including acids, moisture, suspended particles and colloidal impurities.

CARTRIDGE removes impurities and contaminants without affecting active additives in detergent oils.

HIGH MICRO-MECHANICAL ATTRACTION OF FIBRES gives maximum absorption ability and loading capacity. Insures longer and more economical cartridge life.

FIRST CHOICE... wherever used in  
CARGO or OFF-THE-ROAD DIESEL OPERATIONS

Now-a truly advanced,  
specially designed

Here's the latest advanced oil filter for heavy-duty diesel-powered operations! The new Graduflo design is based on fleet-proven DeLuxe engineering which has provided superior performance at lower cost to 1 out of 4 trucks on the road today.

The new Graduflo cartridge designed for this DeLuxe filter also fits and improves performance in other filters of this size.

Write today for performance data: Sales Manager, DeLuxe Products Corporation, Racine, Wisconsin.

## IS ACIDITY RUINING YOUR DIESELS?

MAYBE WE CAN HELP YOU.  
PHONE, WIRE OR WRITE US.

INDUSTRIAL • FILTRATION SERVICE • AUTOMOTIVE  
**Ernest W. Dumler Co., Inc.**  
DEVELOPMENT — ENGINEERING — RESEARCH  
6324 PENN AVE.  
PITTSBURGH 6, PENNSYLVANIA  
PHONE HIland 1-4578

## OFF THE SHELF

*Immediate Shipment!*

**COLUMBIA AC AND DC  
GENERATORS**

A.C. Generators, 2 ball bearing, 50° C, 3 phase, 60 cycle, 0.8 PF, with Damper Winding and Direct Connected Exciter

Gn.	KW	Volts	RPM	Gn.	KW	Volts	RPM
3	350	240/480	1200	1	125	208/120	1200
2	350	4160/2400	1200	1	100	240/480	1800
1	350	2400/1385	1200	1	100	208/120	1800
4	300	240/480	1200	1	75	240/480	1800
1	300	2400	1200	1	60	208/120	1800
1	300	2400/1385	1200	1	50	208/120	1800
1	250	240/480	1200	8	30	416-208/120	1800
3	200	240/480	1200	2	30	240/120	1800
2	200	2400/1385	1200	2	30	208/120	1200
1	150	208/120	1800	9	15	416-208/120	1800
2	150	240/480	1200				

D.C. Generators, 2 ball bearing, drip proof 40° C, Compound wound, 1750 RPM

Gn.	KW	Volts	Gn.	KW	Volts
2	3	125	1	25	125
2	5	125	2	30	125
1	10	125	1	40	250
2	15	125	1	50	125
1	15	250	1	60	250

Write for Illustrated Catalogs

**COLUMBIA ELECTRIC MFG. CO.**  
4557 Hamilton Ave. Cleveland 14, Ohio

—ENdicott 1-8060—

## Administrative Promotions



Richard L. Terrell

Promotion of Richard L. Terrell, former works manager, to the position of administrative assistant to the general manager of Electro-Motive Division of General Motors has been announced by Nelson C. Dezenhof, vice president of General Motors and general manager of Electro-Motive. Mr. Terrell succeeds George W. Elsey, who retired February 1 under provision of the General Motors retirement program. Raymond H. Bish,



George D. Baker



Raymond H. Bish

manager of manufacturing services and facilities, was promoted to works manager, succeeding Mr. Terrell, and George D. Baker, manufacturing manager of the La Grange, Ill., plant, was promoted to assistant works manager.

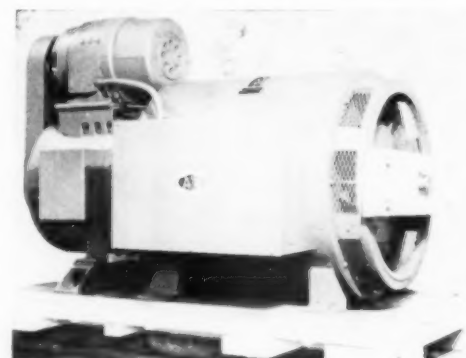
## Purse Seiner



The *Lorrinda G*, a new 36-ft purse seiner, is operating in the fleet of Pacific American Fisheries, Inc. out of Juneau, Alaska. The craft, which has

a top speed of 9.5 knots, is powered by an 87 hp General Motors diesel engine turning a 24 in. x 16 in. propeller through 2.5 to 1 reduction gears. The craft is one of 12 boats in the Pacific American fleet to be powered by GM Diesels during the last year.

## Generator With Engine Cranking Motor



This 187 kva, 120/208 volt, 3 phase, 60 cycle ac generator is partially crated and ready to be shipped to an engine-generator assembler. An interesting feature is that a dc engine cranking motor is mounted on the same shaft with the alternator (left). This engine starting motor has a cranking torque of 600 ft lbs at 200 rpm and will crank continuously for five minutes. The necessary direct current in this case is supplied from storage batteries. The direct current exciter, which supplies dc to the field poles of the ac generator, is mounted on top of the cranking motor and is belt driven. The unit was developed and manufactured by Kato Engineering Company, Mankato, Minnesota.

ITS NEW

## Sales Meeting



The annual sales conference of the Industrial Silencer Division of Burgess-Manning Company of Libertyville, Illinois, and Dallas, Texas, was held recently in Fort Worth, Texas, and was attended by the company's District Managers, Sales Representatives and members of the sales, production and research staff. At the meeting, the market for the company's products, industrial silencers, for the intake and exhaust of internal combustion engines, compressors, etc., and pulsation in gas pipe line systems was discussed and the growing recognition of the deteriorating and costly effects of noise was pointed out by S. G. Paddock, Executive Vice-President of the Company. Unusual engineering problems encountered in the past year and their solutions, along with certain new applications of industrial silencers, were analyzed for the benefit of the entire sales organization.

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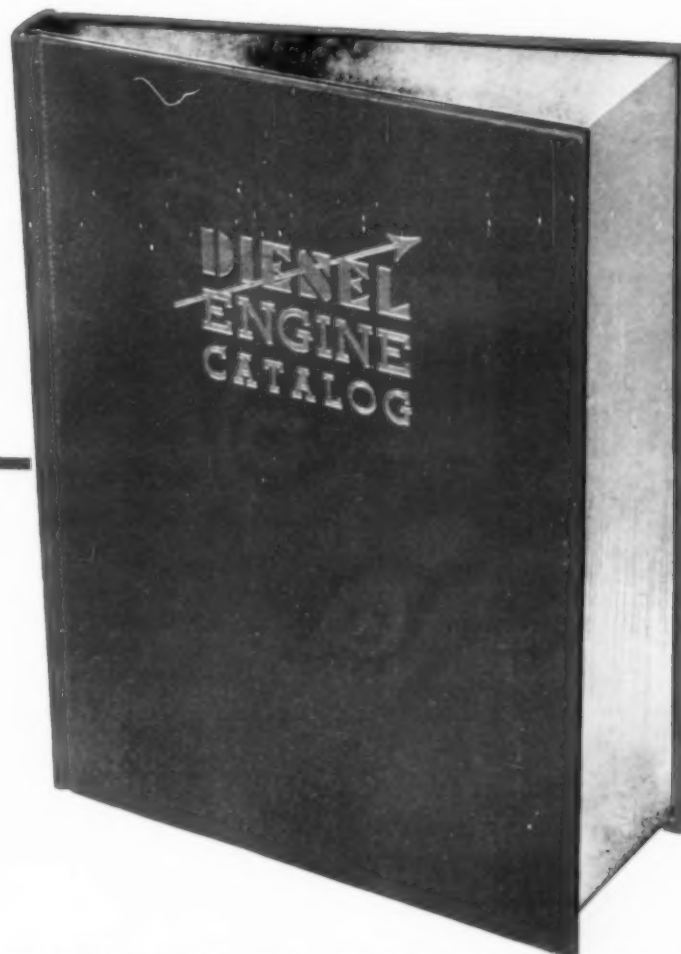
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- 3** **TRANSMISSIONS**—The latest information on torque converters, fluid drives, and other modern means of transmitting power are fully described and illustrated in this section.
- 4** **ACCESSORY EQUIPMENT**—Recent developments in fuel injection systems, governors, and other key accessory units are detailed and illustrated fully in this section.
- 5** **MARKET PLACE**—A convenient, time-saving listing of sources from which you can obtain the multitude of items and services needed by the fast growing Diesel Industry.
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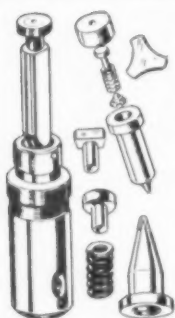
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# TORQUE TALK

FROM

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EQUIPMENT**

## CLARK COMPONENTS ON 7,000-MILE ROAD TOUR

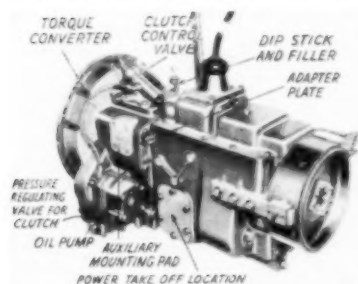
An on-the-spot demonstration of new designs to trucking operators, equipment builders and transport associations was the purpose of a 7,000-mile highway tour recently completed by Clark Equipment Company. Clark's Automotive Division fitted this "semi" rig with their latest ball-joint front suspensions, 10-speed StepMatic semi-automatic transmissions, and air-suspension systems for both truck drive and trailer tandem axles.

Clark officials felt no combination of charts, graphs and motion pictures could substitute for personal, behind-the-wheel tests in telling a transport expert how these products could improve his operation. For more details, cargo inside the trailer consisted of full-scale assemblies and cut-away models of the truck and trailer components, plus other Clark axle, transmission and torque converter designs for special-duty and off-road vehicles.



### NEW POWER TRAIN FOR START-STOP SERVICE

Clark Equipment Company's new TransVerter is ideal for such equipment as house-to-house delivery trucks, buses, garbage trucks and various types of construction machinery. Advantages include elimination



of engine stalling and lugging, sharp reduction in gear shifting, and fine inching control by simple throttle manipulation. The TransVerter can be installed by O.E.M. without major line re-design.

### NEW AXLE LINE FOR OFF-ROAD EQUIPMENT

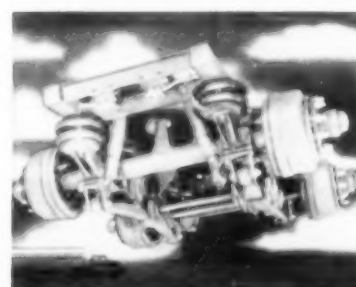
A new line of planetary drive and drive-steer axles, designed especially for heavy-duty vehicles, is now offered by Clark. Planetary drives at hubs puts final power multiplication at point of application; elim-



inates torsional "wind-up" in drive shaft; permits substantial size reduction in steering joint, axle shafts and differential—without sacrificing structural strength.

### TONS OF CARGO FLOAT ON AIR

Damage to fragile or perishable highway cargo—and to empty trailers in transit—can be virtually eliminated by Clark's new Air Suspension. In this system, doughnut-shaped "air-springs" carry full weight of



trailer and cargo, literally "floats" them over bumps with a ride approaching passenger car softness. Lateral roll and sway are minimized by an ingenious system of pivoted torque arms and torsion bars which take the full force of side loads and absorb torsion resulting from brake torque. Other advantages include automatic leveling of the trailer bed, lower maintenance costs and substantial weight reduction possibilities.

## FOR YOUR READING RACK

### NEW AUTOMOTIVE BOOKLET

Dramatic portrayal, in 24 pages, of Clark's basic line of automotive components. Includes illustrations of the Clark constant mesh and synchronized transmissions, TransVerter, StepMatic, power-shift transmissions, torque converters, agricultural units; also automotive driving and steering axles; planetary, industrial and trailer axles; air suspension assemblies; rear axle housings and electric steel castings.

### CLARK FULL-LINE BOOKLET

A 48-page, full-color booklet in handy pocket size is your condensed guide to the entire product line of Clark Equipment Company. Automotive components, materials-handling equipment, construction machinery—all are described in concise detail. Basic information on the eight Clark plants and brief insight into corporate philosophy make this booklet a "must" for your reading rack.

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Mammoth engine room of the "John H. Shary" showing Cooper-Besemer unit rated 4000 hp at 245 rpm. Another 1475 hp Cooper-Besemer supplies auxiliary power.